



FA CUL TY OF POL I T I C A L AND SO C I A L SC I E N C E S

# **Working 9 to 5 for service and devotion**

## **The importance of the psychosocial work environment for employee well-being**

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## INTRODUCTION

“Stress” is a term that is omnipresent in today’s society. Stress is a broad concept and generally refers to situations where people feel overloaded and wonder whether they can cope with the pressures placed upon them. Stress is elicited by many different types of stressful circumstances, labeled as stressors. These stressors can arise in all major contexts of people’s lives (Pearlin & Bierman, 2013). Such an important context is the work environment as work is a central activity in adult life and a resource for satisfying economic and social needs (von Bonsdorff et al., 2011).

The focus of this dissertation is on work stress. The term “work stress” is often used to denote the (adverse) effects on employee health and well-being as a result of the demands of the work environment that do not match the abilities, resources, or needs of the employee (NIOSH working group, 1999). Work stress is an increasing problem in contemporary working life and is a major concern across all employment sectors and occupational levels in most industrialized countries, affecting not only employees but also organizations and society at large (Blewett, Shaw, LaMontagne, & Dollard, 2006). Work stress can contribute to ill-health and decreased well-being but also to high socioeconomic costs for all stakeholders (Levi, Sauter, & Shimomitsu, 1999, Levi et al., 2000; Blewett et al., 2006). It has been suggested that in Europe between 50% and 60% of all lost working days have some link with work-related stress (European Agency for Safety and Health at Work, 2005).

During the past decades, extensive research has focused on the relation between work stress and employee health and well-being. Work stress is found to be associated with a variety of physical and mental health-related outcomes, such as cardiovascular complaints, musculoskeletal symptoms, burnout and depression (Clays et al., 2007a; Clays et al., 2007b; van der Doef & Maes, 1998, 1999; van Vegchel et al., 2005; Vanroelen, Levecque, & Louckx, 2009; Vanroelen, Levecque, Moors, Gadeyne, & Louckx, 2009; Vanroelen, Levecque, Moors, & Louckx, 2010).

Sickness absenteeism and work disability due to work-related health problems are highly prevalent in Belgium, and their associated costs are quite high (Securex, 2006, RIZIV, 2011). The expected costs for organizations and society due to sickness absence and productivity loss were in 2006 estimated on 8.2 billion euro (Securex, 2006). Musculoskeletal complaints and mental health problems are most common work related-health problems causing sickness absences (Securex, 2006, 2013). In total, 20.78% of all absences due to mental health problems can be attributed to work stress (Securex, 2006). An increase of work stress-related problems diagnosed in 2011 was also partially responsible for the

substantial increase in the number of long-term sickness absences in 2012 (Securex, 2013).

Work stress can be situated within a broader social stress process (Pearlin, Menaghan, Lieberman, & Mullan, 1981). According to the social stress paradigm, the context in which employees are embedded, will to a large extent determine the stressors to which they are exposed (Pearlin et al., 1981; Pearlin 1989). Within the work context, various types of stressors can occur at many different levels of reality: micro (e.g. extreme job demands), meso (e.g. work team conflict) and macro (e.g. job insecurity due to economic recession) (e.g. Levecque et al., in press; Ronda et al., 2011; Virtanen et al., 2013). Work stress research has mainly focused on micro level stressors, such as high workload, time pressure, conflicts with colleagues and lack of decision latitude (Härenstam, 2008; van der Doef & Maes, 1998, 1999; van Vegchel, de Jonge, Bosma, & Schaufeli, 2005; Vanroelen et al., 2009). When employees are confronted with workplace stressors, they make an evaluation of the possible threat arising from these stressors for their well-being. When a stressor is perceived as stressful, employees are forced to mobilize their personal and job resources, such as social support from colleagues and their supervisor, to cope with these stressors. Stressors that are unsuccessfully resolved lead to negative stress outcomes, such as depression and sickness absence (Weis & Lonnquist, 2006; Pousette & Hanse, 2002).

To investigate the relation between work and employee health and well-being, several work stress models have been developed within the occupational stress research. Two prominent models are the Demand-Control(-Support) (DC(S)) model (Karasek, 1979; Karasek & Theorell 1990; Johnson & Hall, 1988) and the Effort-Reward Imbalance (ERI) model (Siegrist, 1996). The Demand-Control-Support model (Karasek et al., 1998) focuses on an employee's job demands, job control, and social support as determinants of employee well-being, whereas the ERI model emphasizes the relation between effort and rewards in the prediction of employee well-being. Another important concept that has been found to predict employees' work-related disability, long-term sickness absence and early retirement is work ability (Alavinia, de Boer, van Duivenbooden, Frings-Dresen, & Burdorf, 2009; Burdorf, Frings-Dresen, van Duivenbooden, & Elders, 2005; Pohjonen & Ranta, 2001; Salonen, Arola, Nygard, Huhtala, & Koivisto, 2003).

Within the overarching social stress model (Pearlin et al., 1981), the DCS model (Karasek et al., 1998) and the ERI model (Siegrist et al., 1996) are used in this dissertation as theoretical frameworks for operationalizing the relation between job demands, job resources and employee well-being. Further, the perception of an individual's ability to cope in working life, termed as work ability (Ilmarinen, Tuomi, & Klockars, 1997; Tuomi et al., 1991; Tuomi et al., 1997), is conceived as a component of the social stress process mediating the relation between work stressors and employee well-being. The main aim of this dissertation is to

investigate work stress and work ability in relation to employee well-being.

Despite what is already known about the relation between work and well-being, there are still several important gaps in literature. First, notwithstanding the amount of empirical research, occupational stress models have mainly been tested in relation to physical (e.g. cardiovascular diseases, psychosomatic health complaints, musculoskeletal complaints) and psychological (e.g. job satisfaction, emotional exhaustion) outcomes but to a lesser extent in relation to behavioral outcomes such as work-related withdrawal behavior (van Vegchel et al., 2005). Similarly, few studies have investigated the association between work ability and withdrawal behavior (Camerino et al., 2006; Camerino et al., 2008). A first objective of this dissertation is therefore to assess the effect of work ability and employees' job stressors and job resources, as operationalized by the DCS model and the ERI model, in relation to withdrawal behavior. Two withdrawal behavior outcomes are considered: turnover intentions and sickness absence.

Second, another important element of the work environment is the leadership style of the supervisor. The supervisor's leadership style plays an important role in defining the psychosocial work environment in which employees function (Barling, Kelloway, & Frone, 2005; Cummings et al., 2010) and has been found to influence employee well-being, either positively or negatively (Skakon, Nielsen, Borg, & Guzman, 2010). Nevertheless, although work stress models focus on job stressors and resources, none of these models explicitly considers the leadership style of the immediate supervisor as a potential stressor and/or resource affecting employee well-being. A second objective of this dissertation is therefore to investigate how employee well-being is affected by the supervisor's leadership style, by investigating the direct effect of leadership style on well-being, as well as the possible mediating role played by the employee's psychosocial working conditions, in terms of job demands and job resources (e.g. job control, co-worker support).

The general outline of this dissertation can be summarized as follows. Part I includes Chapter 1 and Chapter 2. Chapter 1 introduces a theoretical framework for studying job characteristics in relation to employee well-being, starting from the overarching social stress paradigm. The research method is presented in Chapter 2, which describes the research design of the different studies, the respondent population and the measurement instruments.

The empirical chapters 3 to 7 are covered in Part II and focus on job stress, work ability and employee well-being in three different occupational groups.

Chapter 8 presents the main conclusions and a general discussion, including the most important findings of this dissertation as well as a critical reflection on the study as a whole. The chapter concludes with recommendations for future research.



# **Part I**

## **General introduction**



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# Chapter 1. THEORETICAL FRAMEWORK

## *1.1. The stress process*

Stress is generally conceptualized as a state of arousal resulting either from the presence of socio-environmental demands that tax or exceed the ordinary adaptive capacity of the individual or from the absence of the means to attain sought-after ends (Lazarus, 1966; Menaghan, 1983; Aneshensel 1992). Stress refers to a state of physiological or emotional arousal, whereas the external circumstances that challenge or obstruct are labeled as stressors. Thus, stress is not an inherent attribute of external conditions, but originates from the situation where discrepancies exist between external conditions and the characteristics of the individual such as his/her perceptions, values, resources and skills (Aneshensel, 1992).

As distinct from a psychological or biological approach, the sociological study of stress focuses on how people's social and economic statuses affect various stress outcomes and allows to observe how deeply well-being is affected by the structured arrangements of people's lives and by the repeated experiences that stem from these arrangements (Pearlin, 1989). Another important characteristic of the sociological study of stress is that change is not conceived as necessarily harmful but as a normal and inevitable feature of every level of social life and aging (Pearlin, 1989). Not the change on its own but the quality of change is potentially damaging, especially those changes that are undesired, unscheduled, non-normative, and uncontrolled (Thoits, 1983).

Several researchers have developed social stress models to describe the effects of stress on individuals (Weis & Lonnquist, 2006). One of these models has been founded by Pearlin et al. (1981). The underpinnings of this model lie in the assumption that the structural arrangements in which individuals are embedded, to a large extent determine the stressors to which people are exposed, the mediators they are able to mobilize, and the manner in which they experience stress (Pearlin et al., 1981). The basic tenet within the social stress paradigm is that stressors increase the risk of distress (i.e. adverse stress outcomes) as a consequence of the filter of individual perception (i.e. appraisal) but resources (i.e. coping and social resources) may buffer these adverse effects (e.g. Coyne & Downey, 1991; Ensel & Lin, 1991; Pearlin et al., 1981; Lieberman, 1982). The core components of the stress process are presented in Figure 1.1.

## Theoretical framework

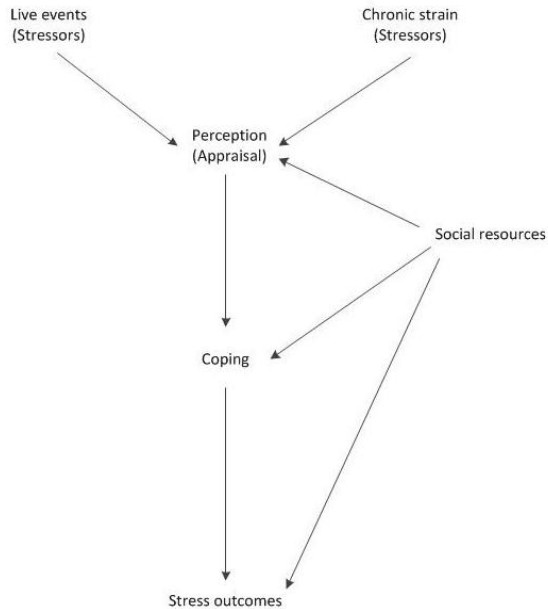


Figure 1.1. *A model of social stress based on Weis and Lonnquist (2006).*

The various systems of stratification that cut across societies such as those based on economic class, gender or ethnicity are an important structural context that brings about such patterns of stressful experiences (Pearlin, 1989). Another important structural context is found in social institutions and their arrangements of roles. Incumbency in a major institutionalized role necessarily involves that people are constantly confronted with conditions and expectations that exert a structuring force on their experience (Pearlin, 1989). Such experience is common among incumbents of family and occupational roles (Kahn, 1973). Moreover, roles do not stand alone but are part of a larger role set (e.g. worker-supervisor) or of a constellation of complementary roles around which important interpersonal relations are structured (Pearlin, 1989). When experiences become a repeated feature of the incumbent's lives, they may be positive for one's well-being by forming sources of privilege, security and harmony. However, the experiences might also be negative and produce considerable stress, resulting in decreased levels of well-being (Levecque, Roose, Vanroelen, & Van Rossem, in press).

The work environment forms a major context in people's life, -a context where they engage with co-workers, subordinates, supervisors and managers-, but also a context in which stressors can arise. The focus of this dissertation is on occupational stress and its effect on employee well-being in three distinct occupational groups. In the next few pages,



we will take a closer look at the four major components of the social stress process, namely (1) stressors, (2) perception, (3) resources, and (4) outcomes of stress. Next, we will dig into the occupational stress models employed in the research papers on which this dissertation is based.

### 1.1.1. Stressors

Stressors refer to circumstances and experiences that challenge an individual to adapt or change. These stressors can impose adverse effects on individual's emotions, cognitions, behavior, physiological functioning, and well-being (Pearlin & Bierman, 2013). The breadth and the variety of stressors people may encounter, stem from the multiple contexts of social life from which stressors can arise. The array of stressors to which people are exposed changes as they age and move along the life course (Pearlin, 2010). Two types of social stressors can be identified: life events and chronic strains (Kessler, Price, & Wortman, 1985; Thoits, 1995).

*Life events* are important specific events or experiences that interrupt an individual's usual activities and require major behavioral readjustments within a relatively short period of time (Thoits, 1995; Weis & Lonquist, 2006). The consequences of an event not only depend on the number of events and the magnitude of the changes they entail, but on the quality of eventful changes as well (Thoits, 1995). A distinction can be made between anticipated life events (e.g. beginning to work or voluntarily leave an organization) and unanticipated life events (e.g. job loss). Events do not necessarily create stress through their direct demand for readjustment but may also exert their effects through their exacerbation of (chronic) role strains (Pearlin et al., 1981). So, the two major sources of stress, life events and chronic strains may converge in the production of stress (Pearlin et al., 1981).

*Chronic strains* are persistent or recurrent demands which require readjustments over prolonged period of time (e.g. disabling injury) (Thoits, 1995). Chronic stressors comprise a wide variety of stressors including ambient strains, quotidian strains and role strains. Ambient strains refer to major ecological sources of stressors that come from an individual's proximal environment, most often measured as their neighborhood (e.g. fear of crime or violence), but these stressors can also occur in the work environment (e.g. fear of being laid off due to company restructuring or downsizing) (Pearlin, 1989; Aneshensel, 1992). Quotidian or daily strains arise out of the daily hassles and require limited readjustment (e.g. getting an unexpected work assignment just before the end of the working day). Role strains focus on the stressors that originate from conflicts or demands within an individual's role set. When problems or strains occur within roles, they are likely to affect their incumbents, because people attach considerable importance to their major roles in life (e.g. being husband/wife, father/mother or employee) (Pearlin, 1989). In the literature, different types of chronic strains or role strains have been described: (1) *role overload* is a consequence of a deficit between excessive environmental demands and the individual's capacity, and is common in

## Theoretical framework

family and occupational roles; (2) *interpersonal conflict* involves the problems and difficulties that occur when people interact in sets of complementary roles, such as supervisor-employee; (3) *inter-role conflict* refers to the incompatible demands of multiple roles (e.g. work and family demands); (4) *role captivity* exists when someone is an unwilling incumbent of a role (e.g. a housewife who prefers outside employment); and (5) *role restructuring* is strain that results from established relationships that undergo change. Although, the actors and the role sets remain the same, either the aging process or external factors force alteration in long-established patterns of expectation and interaction (Pearlin, 1989; Aneshensel, 1992; Wheaton, 1983). This type of strain can occur for example, in situations where an employee, who has sufficient skills and work experience, wants to take up more responsibilities at work, but does not get career possibilities within his/her organization. This can impact upon the relations with co-workers and one's supervisor.

Stressors rarely occur in isolation from one another (Pearlin, 1989). Often, new or 'secondary' stressors emerge from 'primary' stressors, to which people were initially exposed. This process is known as stress proliferation. Proliferated stressors can be in the form of events or chronic strain. Events can create stressful strains (e.g. involuntary job loss can result in economic strain), strains can provoke stressful events (e.g. a long lasting conflict between an employee and his/her supervisor can result in compulsory redundancy), and events and strains each constitute the context that shapes the meanings and the stressful effects of the other (e.g. job loss is often assumed to be stressful without considering whether the job was mainly characterized by dissatisfaction and frustration or whether the job was also rewarding and satisfying (Pearlin, 1989). The distinction between events and chronic strains seems however somewhat arbitrary as the duration of exposures is more assumed than assessed (Kessler et al., 1985; Avison & Turner, 1988). Over time, stressors typically surface as groups or constellations of stressors, some primary and other secondary, that blend events with more durable strains (Pearlin, 1989). For example, the dismissal of a colleague for economic reasons may form a chronic stressor for co-workers as they might fear for their own job. This perceived insecurity may also lead to interpersonal conflicts with the supervisor and other co-workers. These slumbering conflicts can persist for a while and eventually lead to a new event, for instance, the decision of an employee to voluntarily change jobs. However, if an individual is not able to find a suitable job, this may lead to new multiple chronic hardships, such as financial strain and marital conflicts.

Problems rooted in institutionalized roles, such as in occupational roles, are often enduring because both activities and interpersonal relationships with co-workers and supervisors are long lasting (Pearlin, 1989). In general, an employee's work obligations might be experienced as a stressor when the demands and requirements of the job exceed one's capacity (cf. role overload). Job demands constitute an important

dimension in most of the well-known occupational stress models, such as the Demand-Control-Support model (DCS) (Karasek, 1979; Karasek & Theorell 1990; Johnson & Hall, 1988; Karasek et al., 1998), the Effort-Reward Imbalance model (ERI) (Siegrist, 1996) and the Demands-Resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

Although job demands are usually given a lot of attention as potential sources of stress at the workplace, other stressors might also be considered. An important one that is not always explicitly considered in occupational stress models arises within the role sets of employees and their supervisors. Supervisors mold the psychosocial work environment of their employees (Barling et al., 2005; Skakon et al., 2010; Cummings et al., 2010) and can form a stressor of their own (Nyberg et al., 2011). For instance, a leader who has the ability to intervene in a serious conflict between employees, but waits to take his/her responsibility until the problems get out of hand, may become a stressor for those employees who are involved. In this research, we will go more deeply into the leadership style of the direct supervisor as a potential stressor.

### 1.1.2. Perception

Neither events nor chronic strains are stressful on their own but are situations or occurrences in which the likelihood of a stressful response is increased (Weis & Lonnquist, 2006). It is the perception of these stressors and the individual's appraisal of the implications of these stressors that are stressful. When faced with a stressor, an individual first evaluates the potential threat by judging the significance of an event as stressful, positive, controllable, challenging or irrelevant, and subsequently assesses the resources one has to cope with these stressors (Lazarus & Folkman, 1984; Cohen, 1984). This appraisal process does not involve the "real event" but the individual's perception of the real event (Weis & Lonnquist, 2006). Consequently, the same stressor can provoke disparate stress responses in different individuals given that a situation is only stressful in interaction with the individual perceptions and abilities to cope with this situation (Pearlin & Bierman, 2013). Individual perception can be considered as something which is in constant interaction with the social environment and as a result susceptible to modification (Moyle, 1995).

### 1.1.3. Resources

People differ considerably in the ways and intensity to which their well-being is affected by exposure to the same stressor (Pearlin & Bierman, 2013). Differences in the response to the same stressor, regardless whether the sources are life events or chronic role strains, can for a large extent be attributed to differences in the resources of individuals. Resources are the personal and social resources that are capable of altering the effects of stressors on people's well-being. Most studied resources within sociological research are *coping* and *social support* (Coyne & Downey, 1991; Kessler et al., 1985; Pearlin, 1989). Resources may have

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an additive effect, as well as a moderating or a mediating function in the stress process (Pearlin, 1999). The additive effect of high job demands (i.e. stressor) in combination with low decision latitude (i.e. resources) can cause psychological distress (van der Doef & Maes, 1999; Hausser, Mojzisch, Niesel, & Schulz-Hardt, 2010). A moderator is a qualitative variable (e.g. gender, race) or a quantitative variable (e.g. levels of reward) that influences the strength of the relations between the stressors and the stress outcome (Baron & Kenny 1986). For example, the negative effect of an excessive work load on employee well-being may be reduced by high levels of reward at work (e.g. van Vegchel et al., 2005). Beside this buffering effect, resources can also function as mediators when they are related to both the stressors and the stress outcomes (Baron & Kenny, 1986). For example, work characteristics, such as role clarity, are found to mediate the relation between transformational leadership style and employee well-being (Nielsen, Randall, Yarker, & Brenner, 2008).

## Coping

Coping refers to the behavioral and cognitive efforts people make in an attempt to avoid or attenuate the impact of a stressor. It can be conceived as the process of reciprocal interactions between an individual and the environment (Bandura, 1977; Kessler et al., 1985). Coping behaviors vary with the nature of problems people face and with the social roles in which the problems emerge (Pearlin et al., 1981). Coping behavior may be directed at the demands themselves (problem-focused strategies) or at the emotional reactions which often accompany those demands (emotion-focused strategies) (Thoits, 1995). In general, problem-focused coping is more likely when situational demands are appraised as controllable, whereas emotion-focused coping is more likely when demands seem uncontrollable (Folkman, 1984). Diverse *coping strategies* can be distinguished: changing the situation that is causing the stressor (e.g. finding a new job after being fired), avoiding or eliminating the stressor (e.g. making clear arrangements with colleagues to avoid future conflicts), and managing the meaning of the situation in a manner that reduces its threat (e.g. looking at increased job responsibility as an opportunity instead of a burden) (Pearlin et al., 1981; Thoits, 1995). Coping strategies are normative modes of coping that people acquire from interacting with each other and by sharing important social conditions (Pearlin et al., 1981). In order to make use of these coping strategies individuals need coping resources which can be either personal or social.

*Coping resources* are pre-existing assets such as sense of mastery and self-esteem, upon which people may draw when stress arises (Aneshensel, 1992; Pearlin, 2010; Turner & Lloyd, 1999). Mastery refers to the individual's self-perception of the ability to control the forces that affect one's life. Self-esteem involves judgments about oneself as a good, valued, and competent person (Pearlin & Schooler, 1978). Both coping resources are expected to influence the choice and/or efficacy of the coping strategies people use in response to stressors (e.g. Folkman,

1984). Research on personal resources has mainly focused on mastery, less on self-esteem, but both types have been found to directly reduce or mold the severity and prevalence of stress outcomes (Ross & Mirowsky, 1989; Schieman, Nguyen & Elliott, 2003).

In an occupational context, the internal coping resource of mastery can be linked to the dimension of job control in the Demand-Control-model (Karasek et al., 1998), while the concept of self-esteem is more closely related to the dimension of reward in the Effort-Reward-Imbalance model (Siegrist, 1996). Both control and reward can be conceived as coping resources. However, a lack of control over the work environment and low rewards can also act as a stressor in the stress process (Beehr, Glaser, Canali, & Wallwey; van Vegchel et al., 2005; Li et al., 2011).

A related concept is that of *coping styles*, these are more general coping behaviors that individuals use when confronted with stressors across a variety of situations (e.g. withdraw or approach, deny or confront, become active or remain passive) (Menaghan, 1983). A work-related formulation of coping styles can be found in overcommitment and learning motivation. Overcommitment is a distinct personal pattern of coping with job demands, reflecting excessive work-related commitment and striving, in combination with a strong need to be approved and esteemed (Siegrist et al., 2004). Learning motivation can be conceived as a positive coping pattern and refers to the motivation of employees to acquire new knowledge and skills on their job and the willingness to solve problems at their job (Taris, 2004). Being highly motivated to learn new things at work can influence the way employees appraise their job demands.

### Social support

Social support can be defined as a social “fund” from which people may draw when dealing with stressors (Thoits, 1995). Social support usually refers to the functions performed for the individual by significant others, such as family member, friends, co-workers and supervisor (Coyne & Downey, 1991, Thoits, 1995). These significant others can provide instrumental support (task specific help), informational support (information, advice and knowledge), and/or emotional support (empathy, affect and comfort) (House & Kahn, 1985). These types of support are usually highly correlated and often form a single underlying factor, referred to as received or perceived social support (House & Kahn, 1985). Support may be actually received from others or simply perceived to be available when needed. The effects of perceived social support have most frequently been examined in the literature (Pearlin & Bierman, 2013), Social support, especially perceived emotional support (i.e. beliefs that love and caring, sympathy and understanding and/or esteem and value are available from others) has been found to be inversely related to diverse forms of psychosocial disorder (Bertera, 2005; Cairney, Corna, Veldhuizen, Kurdyak, & Streiner, 2008; Thoits, 2011). The degree to which people can draw on social relations for support not only depends

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on the extensiveness of the relations and the frequency of interaction (Pearlin et al., 1981; Kessler et al., 1985). Being embedded in a network is a necessary condition for having access to support but more important is the quality of the relations one is able to find within the network. The qualities that seem to be especially critical involve the exchange of intimate communications and the presence of solidarity and trust (Pearlin et al., 1981). A meta-analytic research showed that social support has a threefold effect on the work stress process (Viswesvaran, Sanchez, & Fisher, 1999). Social support mitigates the adverse stress outcomes, reduces the level of the perceived stressors and moderates the stressor-outcome relationship as well. Although social support has been found to have positive effects, social relations can also form potential stressors, for example when support is lacking (Viswesvaran et al., 1999; Cronkite et al., 2013) or when the negative aspects of social relations outweigh the positive consequences (e.g. co-worker conflicts or bullying behavior) (Coyne & Downey, 1991; Nielsen, 2013).

In the work context, the social support by co-workers and supervisor might be of great importance as a resource to deal with job demands. Social support is a core dimension of the DCS Model (Johnson & Hall, 1988; Karasek et al., 1998). This model distinguishes between co-worker support and the support from the (direct) supervisor (Karasek et al. 1998). In this dissertation, we also consider the social support of co-workers separately from that of the supervisor. Supervisor support will be integrated in a framework that explicitly considers the role of leadership style in the stress process of employees.

Social support and coping are generally treated in research as separate and unrelated issues. However, they have similar functions in the stress process as each is a resource that people can apply to moderate or mediate the effects of stressful conditions. Individuals faced with an array of stressors do not choose between coping and support, but use both in an attempt to avoid, eliminate or reduce distress (Pearlin & Bierman, 2013).

### 1.1.4. Stress outcomes

The final step in the stress process is the manifestation of stress (Pearlin et al., 1991). Stress leads to a wide variety of outcomes through a wide variety of pathways (Weis & Lonnquist, 2006). As opposed to the biomedical approach, sociologists usually rely on outcomes that can be assessed through direct observation, medical records, or self-evaluations and reports (Pearlin, 1989). Examples of stress indicators found in sociological studies include health histories, physical health symptoms, indicators of mental health, such as anxiety, anger, and depression, alcohol and drug abuse, inability to fulfill role obligations and the disruption of social relationships (Pearlin, 1989). So, psychological, physical and behavioral outcomes have been addressed as outcomes of the stress process. Pearlin (1989) argued that none of these outcomes have theoretical priority over the others, but suggested to avoid the reliance on a single-outcome indicator. The observation of multiple outcomes is desirable because people

with different social and economic characteristics may also have different modes of manifesting stress (Aneshensel, 1992). If only a single outcome indicator is considered, those who respond to a stressful experience by manifesting some other forms of distress are mistakenly treated as though they are unaffected by the stressor (Aneshensel, Rutter, & Lachenbruch, 1991). For example, men and women may not differ in their overall vulnerability to stressors, but differ instead with regard to particular outcomes to which they are vulnerable (Pearlin, 1989). A study by Aneshensel (1988) showed that apparent gender differences in vulnerability to stressors disappear when excessive drinking and other outcomes are considered along with depression. In this dissertation, we focus on three specific stress outcomes, namely work-related well-being, absenteeism, and turnover intention. Well-being can be conceptualized as having both a psychological (e.g. work-related well-being) and a behavioral component (e.g. withdrawal behavior) (e.g. Kahn & Byosiene, 1992). Behavioral stress outcomes are mostly negative ways of responding to stressors that cause harm to an individual (Beehr, 1995). People might react to stressors by several different forms of behavior, such as alcohol abuse, aggression or other forms of violent behavior. Within a work context, one can also get into other forms of behavior, such as lowered productivity, worker incivility and withdrawal behavior.

Withdrawal behavior is an umbrella term covering behaviors that represent physical removal from the workplace either for a part of the day, an entire day or permanently (e.g. Johns 2001; Koslowsky, 2000). Examples from work-related withdrawal behavior that vary in degree of severity are lateness, absenteeism and turnover. *Lateness* or tardiness is defined as the tendency of an employee to arrive at work after the scheduled starting time (Adler & Golan 1981). This less severe form of withdrawal behavior is however not considered as a stress outcome in this dissertation, but absenteeism is. *Absenteeism* is typically for an extended period of time or for an excessive amount of days and is defined as an individual's lack of physical presence at a given location and time when there is a social expectation for him or her to be there (Martocchio & Harrison, 1993; Cohen & Golan, 2007). Absenteeism from work can have many diverse causes, such as being absent to care of a sick child or elder. In this dissertation, we restrict our focus to absenteeism because of sickness. Sickness absence results from an inability to attend work primarily due to illness or a weakened state of well-being (e.g. Johns, 2002). Bakker and colleagues (2003) suggested that there are two explanations for employees' decisions to report themselves sick. First, employees may be absent because they want to withdraw from adverse work conditions (Schaufeli, Bakker, & Van Rhenen, 2009; Bakker et al., 2003). This can be considered as 'voluntary' absenteeism because it can be interpreted as an escape from, compensation for, or even protest against aversive or demoralizing work circumstances (Chadwick-Jones, Nicholson, & Brown, 1982; Bakker et al., 2003). Voluntary absenteeism is generally operationalized as absence frequency, referring to the number of epi-

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sodes an employee has been absent from work during a specified period, regardless of the length of each of those episodes (Steel, 2003). A second explanation for absenteeism is that absence behavior is a reaction to occupational stress, resulting from the inability rather than the unwillingness to work, for instance as a result of involuntary factors such as illness (Schaufeli et al., 2009). Absence duration can be considered as an indicator of 'involuntary' absenteeism and is defined as the total length of time (e.g. number of days) a worker has been absent from work over a certain period regardless of the number of absence episodes (Steel, 2003). Both absence frequency and duration are included as stress outcomes in this dissertation.

*Turnover* is generally defined as the termination of an individual's formal membership with an organization (Lee, 1997). Turnover can either be involuntarily (i.e. due to dismissal, layoff or forced early retirement) or voluntarily (Tai, Bame, & Robinson, 1998). The focus of this dissertation is on voluntary turnover which is the permanently voluntary withdrawal from a job. Several types of voluntary turnover can be distinguished (Jackofsky, 1984). One relevant distinction relates to the destination of the new job. A distinction can be made between intra-occupational and inter-occupational turnover (Wright & Bonett, 1992). Intra-occupational turnover involves job movement within the same occupation (i.e. a new job within the nursing profession). Inter-occupational turnover concerns movement to any job external to the current occupation (i.e. outside the nursing profession). Similarly, a distinction can be made between organizational turnover and within-organizational turnover. This latter type of turnover refers to changing jobs within the same organization. For example, a nurse who wants to work in another department within the same hospital. Turnover is the last step in a complex decision-making process in which several turnover cognitions play a role (Mobley, 1977; Sager, Griffith, & Hom, 1998). Turnover cognitions represent mental decisions that intervene between an individual's attitudes regarding a job and the decision to stay or leave (Sager et al., 1998). Examples of turnover cognitions are thinking of quitting (i.e. an employee considers leaving the organization), intent to search for a new job (i.e. an employee decides to look for a job) and intent to quit (i.e. an employee decides to quit the organization at some unspecified point in the future) (Mobley 1977; Sager et al., 1998). In this dissertation, focus is on turnover intention as an outcome of the stress process. Turnover intention reflects the (subjective) probability that an employee will change his job within a certain time period but in contrast to actual turnover, turnover intentions are not definite (Sousa-Poza & Henneberger, 2004). Turnover intention is considered the most immediate and most accurate predictor of actual turnover (Mobley 1977; Griffith, Hom, & Gaertner, 2000). The assumption that self-reported intentions are the best predictors of behavior has been elaborated in the theory of reasoned action and the theory of planned behavior developed by Fishbein and Ajzen (1975) and Ajzen (1985, 1991).



## ***1.2. Occupational stress***

The social processes described above can take place in many different contexts. One major context in the life of employees is the work context, which might entail stressors at many different levels of reality: micro (e.g. extreme job demands), meso (e.g. work team conflict) and macro (e.g. job insecurity due to economic recession). Occupational stress research has mainly focused on micro level stressors (Härenstam, 2008). Occupational stress can be conceptualized as the harmful physical and emotional responses that occur when the job demands outweigh the capabilities, resources, or needs of the employee (NIOSH working group, 1999; Muntaner, Benach, Hadden, Gimeno, & Benavides, 2006). Several work stress models have been developed in an attempt to shed light on how employee well-being is affected by workplace conditions (for an overview, e.g., Cooper, Dewe, & O'Driscoll, 2001). Two of the most influential work stress models are the Demand-Control(-Support) model (Karasek, 1979; Karasek & Theorell, 1990), and the Effort-Reward Imbalance model (Siegrist, 1996). The Demand-Control (DC) model was developed during the 1970s and 1980s to reflect work stress in the era of industrial production. The ERI Model is a more recent work stress model, which has gained in popularity since the 1990s. The ERI model captures some of the stress associated with the post-industrial work life, such as flexibility and job security (Nyberg, 2009).

### **1.2.1. Demand-Control(-Support) model**

The DC model is based upon two research traditions that both attempt to relate psychosocial job characteristics to employee well-being. The first tradition focused on job decision latitude, as its primary aim was to inform the (re)design of jobs in order to increase motivation, satisfaction, and performance at work (e.g. Hackman & Oldham, 1980). The second tradition focused on “stressors” at work (e.g. Caplan, Cobb, French, van Harrison, & Pineau, 1976), such as high workload, role conflict, and role ambiguity (e.g. French & Kahn, 1962). However, both traditions did not consider both work characteristics as important elements for employee well-being (Karasek, 1979). Karasek (1979) developed the Demand-Control (DC) model as a two-dimensional model that distinguishes two important characteristics of the work environment: the job demands placed on the employee and the discretion the worker has in deciding how to meet these demands (job control). Within the DC model, job demands are defined as the psychological stressors in the work environment and relate to the mental work load, time pressure and conflicting demands (Karasek & Theorell, 1990; Choi et al., 2012). Job control or decision latitude is a composite of both skill discretion and decision authority. Skill discretion refers to the breadth of skills and creativity required on the job, and decision authority relates to the possibilities for workers to make decisions about their work. Skill discretion and decision authority are closely related theoretically and empirically and are

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therefore often combined (Levi et al., 2000). The DC model gives rise to several predictions. First, the strain hypothesis states that the highest levels of adverse health and well-being results from a combination of high job demands and low decision latitude (Karasek & Theorell, 1990). Second, the active learning hypothesis states that the highest level of learning, motivation, and personal growth takes place in jobs characterized by high job demands in combination with high decision latitude (Karasek & Theorell, 1990). Third, the buffer hypothesis states that job control can moderate the negative effects of high demands on well-being.

In a later phase, the original DC model was expanded with another work environmental characteristic: social support. Social support refers to overall levels of helpful social interaction available at work from co-workers and supervisors (Johnson & Hall, 1988). Apart from the main effects of high job demand, low control over the work environment and low social support on employee health and well-being, the Demand-Control-Support (DCS) model implies some specific hypotheses regarding the combination of demand, control and support. The central proposition of the extended DCS model is that employees with high job strain in combination with low social support at work are the most vulnerable to poor employee health and well-being also termed iso-strain (Johnson & Hall, 1988; Karasek et al., 1998). The buffer hypothesis states that social support can moderate the negative impact of high strain on well-being. So, both job control and social support are to be considered as stress moderators given that high levels of job control and social support are assumed to counteract the negative effects of high job demands. Technically, the buffer hypotheses may be distinguished from the other hypotheses as the difference between interactive associations (buffer) and additive associations (job strain, active learning and iso-strain) (van der Doef & Maes, 1999).

The DC(S) model stimulated a large amount of empirical research. Numerous studies have used the DC(S) model to examine associations between psychosocial working conditions and outcomes of psychological distress and employee health and well-being (e.g. Clays et al., 2007a; Hausser et al., 2010; Kivimäki et al., 2012; van der Doef & Maes, 1999; Vanroelen et al., 2009a). Two review studies revealed that the literature provides considerable support for main effects of job demands, job control and social support (Hausser, et al., 2010; van der Doef & Maes, 1999). Support for the moderating influence of job control and support is less convincing (Akerboom & Maes, 2006; Vanroelen et al., 2009a). Findings also indicate more empirical support for additive effects of job demands, job control and social support (Hausser et al., 2010; van der Doef & Maes, 1999).

### 1.2.2. Effort-Reward Imbalance model

Whereas the DCS model explicitly focuses on situational characteristics of the psychosocial work environment, the ERI model includes

both situational characteristics (effort and reward) and an intrinsic characteristic (i.e. overcommitment) (Siegrist, 1996). The ERI model also differs from the DC model with regard to the underlying theoretical stress paradigm (Levi et al., 2000). The DC model is rooted in the stress-theoretical paradigm of personal control. Within this paradigm, the range of control over one's work situation is the core dimension. The ERI model fits in better with a stress-theoretical paradigm of social reward that is based on the principle of social exchange, i.e. reciprocity and fairness (Levi et al., 2000). Social reciprocity lies at the core of the psychological work contract, which defines distinct obligations to be performed in exchange for adequate rewards. The central tenet of the ERI model is that a lack of reciprocity between high 'costs' (effort) and low 'gain' (rewards) defines a state of emotional distress, which in turn can result in a sustained stress reaction and adverse effects on health and employee well-being (Siegrist, 1996). Siegrist (1996) defines efforts as job demands and/or obligations that are imposed by the employer. Occupational rewards comprise money (adequate salary), esteem (respect and support by co-workers and supervisor), and occupational status (career opportunities including job security) (Siegrist, 1996). Having a demanding job combined with high job insecurity or working hard without being offered any promotion are examples of high cost/low gain conditions at work. It is assumed that people will not passively remain in a high effort–low reward situation, but instead will try cognitively and behaviorally to reduce their efforts and/or maximize their rewards (van Vegchel et al., 2005). However, the ERI model predicts continued high efforts, and thus chronically stressful experience, under the following conditions: (1) lack of alternative jobs in the labor market may prevent employees from giving up unfavorable jobs, as the anticipated costs (e.g. the risk of being laid off) outweigh costs of accepting inadequate benefits, (2) unfavorable job conditions may be tolerated for a certain period for strategic reasons (e.g. to improve chances for career promotion), (3) overcommitment may prevent employees from accurately assessing cost-gain relations (Siegrist, 1996). Overcommitment defines a set of attitudes, behavior, and emotions reflecting excessive striving in combination with a strong desire to be approved and esteemed (Siegrist, 1996).

The ERI model proposes three hypotheses (Siegrist, 1996; Siegrist et al., 2004). First, according to the extrinsic hypothesis, an imbalance between (high) extrinsic effort and (low) rewards increases the risk of poor health and well-being. Second, according to the intrinsic hypothesis, a high level of overcommitment increases the risk of poor health and well-being. Third, according to the interaction hypothesis, an effort-reward imbalance in combination with a high level of overcommitment leads to the highest risk of poor health and well-being (Siegrist, 1996; Siegrist et al., 2004). A complete test of the ERI model covers all three of these conditions (i.e., effort, rewards, and overcommitment) (Siegrist, 2004). Although, the extrinsic hypothesis has been most extensively studied (van Vegchel et al., 2005)

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In numerous studies, the ERI model has been applied to a wide range of health outcomes (for a review see Tsutsumi & Kawamaki, 2004; van Vegchel et al., 2005), in particular to cardiovascular disease outcomes (Kuper, Sing-Manoux, Siegrist, & Marmot, 2002; Baché, Seidler, Latza, Rossnagel, Shumann, 2012), but the model has been tested to a lesser extent in association with behavioral outcomes (e.g., sickness absence), and job-related well-being outcomes (e.g., work motivation, job satisfaction) (van Vegchel et al., 2005).

### **1.2.3. Occupational stress models: a comparison**

The DCS model and the ERI model originate from different theoretical backgrounds and research traditions. Although these occupational models have their own particularities they are not mutually exclusive. The most important differences and similarities are briefly enumerated.

The DCS model offers a broader approach as the model includes a stress dimension with relevance to health and a skill dimension related to personal growth and development. In this regard, the ERI model is more narrowly focused on determinants of health and well-being (Levi et al., 2000). Another difference is that the components of the ERI model (salaries, career opportunities/job security) are linked to more distant macro-economic conditions, while the DCS model mainly focus on workplace characteristics (Levi et al., 2000).

However, what the DCS model and the ERI model have in common is that they emphasize specific aspects of the complex psychosocial work environment, more specifically they focus on the job demands that are imposed on the employee (e.g. psychological job demands (Karasek, 1979) and job-related effort (Siegrist, 1996)), and on the resources to cope with these demands. These resources differ according to the chosen model. The coping resources within the DCS model are job control and social support by co-workers and supervisors (Karasek et al., 1998). Within the ERI model the rewarding aspect of the job in terms of esteem, salary and career opportunities serve as coping resources (Siegrist, 1996). In this way, both models can be seen as balance or compensation models. In line with the overarching stress process, demands can be conceived as stressors at the workplace and resources can be seen as those aspects that mediate and/or moderate the negative effects of job demands on employee health and well-being. However, these resources on their own can have a direct impact upon the stress outcomes as well (Karasek et al. 1998, van der Doef & Maes, 1999, Vanroelen et al., 2009a, van Vegchel et al., 2005).

### **1.2.4. Work ability**

Next to the workplace stressors and resources, the individual's perception of these stressors and coping resources is an important constituent component of the social stress process (Weis & Lonquist, 2006). Work ability can be conceived as an individual's appraisal of the stressors

in the work environment, and of one's personal resources to deal with these stressors. The concept is based on the assumption that work ability is determined by an individual's perception of the demands at work and his or her ability to cope with these demands (Feldt, Hyvonen, Makikangas, Kinnunen, & Kokko, 2009; van den Berg et al., 2008). The conceptual background of the work ability is based on the stress-strain concept and balance model, where workers' personal resources are compatible with their work demands (Ilmarinen et al., 1997; Ilmarinen, 2009). These resources mainly consist of functional capacities (physical, mental, social) and the individual's health but also entail competence (i.e. education and professional knowledge), values and attitudes, and motivation (Ilmarinen, 2005). Work demands depend on the work characteristics, such as physical and psychosocial requirements of work, and the organization of work. If work demands permanently exceed employees' resources, work ability decreases (Ilmarinen et al., 1997). Work ability is a dynamic process which results from the interaction of working conditions, individual characteristics and society (Ilmarinen et al., 1991; Ilmarinen, 2001; Ilmarinen, 2009). The factors affecting work ability are continuously changing as personal resources change, for example, with age, whereas work demands change, for example, due to new technologies (Ilmarinen, 2009).

The concept of work ability has its origin in occupational health research and was developed in the early 1980s in Finland, and later adopted in many European and Asian countries, as an instrument to increase work participation and to promote the health and functional competencies of employees (Ilmarinen, 2009; Tuomi et al., 1997, van den Berg et al., 2009). Numerous studies have shown that work ability is an important determinant for employee well-being and productivity at work (e.g. Ahlstrom, Grimby-Ekman, Hagberg, Dellve, 2010; Feldt et al., 2009; Tuomi, et al., 2001; van den Berg, Elders, de Zwart, & Burdorf, 2009).

### **1.2.5. Occupational stress: What's missing?**

Thus far, the DCS model and the ERI model have been extensively empirically tested with regard to numerous outcome variables, from physical (e.g. cardiovascular measures) to psychological (e.g. job satisfaction and exhaustion) and behavioral outcomes (e.g. alcohol abuse). Most studies though focused on cardiovascular and psychological well-being (de Lange, Taris, Kompier, Houtman, & Bongers, 2003; van der Doef & Maes, 1999; van Vegchel et al., 2005; Hausser et al., 2010). Work ability has mainly been investigated in relation to psychosomatic complaints, early retirement, long-term sickness absence, and long-term disability (Pohjonen & Ranta, 2001; Burdorf et al., 2005; Salonen et al., 2003; Feldt et al., 2009). Notwithstanding the amount of empirical research, both occupational models and work ability have been to a far lesser extent investigated in relation to work-related withdrawal behavior (de Lange et al., 2003; van Vegchel et al., 2005). Few studies have investigated the DCS model in relation to employees' turnover intention (e.g. Widerszal-

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Bazyl et al., 2008; Hasselhorn et al., 2008). Similarly, turnover intention was only addressed in some studies based on the ERI model, but these studies were largely based on cross-sectional designs (e.g. Hasselhorn, Tackenberg, and Peter, 2004; Kinnunen, Feldt, & Makikangas, 2008; Lavoie-Tremblay, O'Brien-Pallas, Gelinas, Desforges, & Marchionni, 2008), except for the study by Li et al. (2011). In addition, only few studies have examined the association between work ability and employees' turnover intentions (Camerino et al., 2006; Camerino et al. 2008). In order to advance research with regard to these models and work ability, behavioral outcomes such as withdrawal behaviors need to be included. Therefore, a first empirical aim of this dissertation is to test these occupational stress models and work ability in relation to withdrawal behavior outcomes.

While social support is within the stress process conceived as an important resource to cope with a variety of stressors, only the DCS model explicitly includes it. Theoretically, the DCS model makes a distinction between two sources of support: support from the supervisor and support from co-workers, but empirically this distinction is often neglected. The main effect and the buffer effect are commonly tested for the general support construct. However, it is important to distinguish between the co-worker support and supervisor support as these relations entail a different balance of power. The social support by the direct supervisor in the DCS model is largely defined by the extent to which supervisors are helpful, show concern for the well-being of their employees and listen to their employees (Karasek et al., 1998). In this dissertation, both co-worker and supervisor support will be considered as possible resources that moderate the effect between job stressors and employee well-being but supervisor support will be integrated in a framework that explicitly considers the role of leadership style in the stress process of employees.

### Leadership style: a stressor or a resource?

How a leader acts and behaves, plays an important role in defining the psychosocial work environment in which employees function, and strongly depends on their leadership style (Nielsen et al. 2008; Arnold, Turner, Barling, Kelloway, McKee, 2007). Leadership style is defined as "relatively stable patterns of behavior that are manifested by leaders" (Eagly & Johannesen-Schmidt, 2001, p. 781), or "the alternative ways that leaders pattern their interactive behavior to fulfill their role as leaders" (Bass, 1990, p. 27). Various types of leadership style have generally been found to influence employees' stress and well-being, either positively or negatively (Skakon et al., 2010). A notable limitation of the described occupational stress models and work ability is that none of them considers the leadership style of the immediate supervisor as a potential source of stress or as a resource.

A supervisor can adopt different leadership styles like a relationship-oriented style or a task-oriented style. Both types of leadership style

correspond to the main styles of classic leadership research (Stodgill & Coors, 1957). A relationship-oriented leadership style is labeled as ‘consideration’ and is characterized by behaviors such as helping subordinates by acting in a facilitative and supportive manner, being friendly and available for subordinates and involving employees in decisions (Eagly & Johannesen-Schmidt 2001). This type of leadership style corresponds to social support by the supervisor, as defined by the DCS model, and can be considered within the social stress process as both a resource (i.e. when supervisor support is present) and stressor (i.e. when supervisor support is lacking) (Viswesvaran et al., 1999; Thoits, 2011). Supervisors can also adopt a task-oriented leadership style. This leadership style is labeled as ‘initiating structure’ and is characterized by a strong focus on achieving goals by giving employees clear rules and instructions regarding work activities, by maintaining standards for performance and by determining the consequences of goal attainment (Eagly & Johannesen-Schmidt, 2001; Judge, Piccolo & Ries, 2004). This type of leadership can be conceived as a potential stressor within the social stress process.

The leadership style of the supervisor may not only directly influence employee well-being but may also impact upon the other constituent components of the stress process. For instance, by establishing the pace of work and the amount of work that has to be done, and by specifying deadlines, supervisors can impose high workloads (i.e. job demands) on their employees. Task-oriented leaders may give employees the feeling that they have no say in how rules and procedures are established regarding their work activities which in turn can reduce their job control (Judge et al., 2004), while supportive supervisors are more likely to involve employees in decisions concerning their job tasks. Supervisors also have the power to determine the rewards their subordinates receive in return for their efforts at work, not only in terms of salary and career opportunities but also in terms of esteem (Holtz & Harold, 2013). The supervisor’s leadership style can also influence the social relations at work, for example by creating either a collaborative or a competitive work climate.

A second research objective of the current dissertation is to assess how a relationship-oriented and a task-oriented leadership style affect employee well-being. We investigate both the direct effects on well-being and the possible mediating role played by the employee’s psychosocial working conditions, in terms of demand, control and co-worker support.

Previous research has shown that female employees express a greater preference for leaders adopting a relationship-oriented leadership style than their male colleagues (Vecchio & Boatwright, 2002; Bellou, 2011). Consequently, a supportive leadership style might be more beneficial for men than for women. However, while the leadership styles of male and female leaders have received considerable attention (e.g. Eagly, Johannesen-Schmidt, & van Engen, 2003; Koenig, Eagly, Mitchell, & Ristikari, 2011), less is known about the effect of the supervisor’s leader-

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ship style on the well-being of male and female employees. Therefore, an additional objective of this dissertation is to investigate if a task-oriented and a relation-oriented leadership style differently affect the well-being of male and female employees.

### Occupational structure

Within the occupational stress research based on the DCS model, the ERI model and work ability, organizational or group characteristics have hardly ever been considered. Although both the DCS and the ERI model are basically individual level models that look at how workers cope with occupational stress, they both implicitly assume that psychosocial working conditions are multidimensional phenomena determined by processes at different organizational levels (Härenstam, 2008). For example, Theorell and Karasek (1996) wrote that “decision latitude is determined to a great extent by the content of work in the occupation, whereas the demands and social support to a greater extent reflect local work site conditions and individual perception [p 18]”. This context, however, never features explicitly in these models, and workplace conditions in the DCS and ERI model are almost exclusively defined at the micro level without considering meso (e.g. gender-balanced organization, work team climate) and macro level (e.g. structural problems on the labor market) factors that are essential from a social stress perspective.

At the macro level, the occupational structure delineates a group of positions that are differentiated by the nature of the work to be accomplished, the tasks carried out, the responsibilities bestowed on the individual, and the sector of activity in which the work is performed (Marchand, Demers, & Durand, 2006). Thus, the occupational context, in which employees operate, defines to a large extent the workplace stressors and employees’ resources to cope with these stressors (Karasek & Theorell, 1990; MacDonald, Karasek, Punnett, & Scharf, 2001). The management, reward and control systems may differ substantially between various occupational settings and have a great impact on workers’ job demands, decision latitude, social support and rewards (Härenstam, 2008). For example, the remuneration system for a specific occupation (e.g. teachers, nurses) is legally defined by the Belgian labor legislation. Further, the way in which the work is hierarchically organized and the extent to which workers are involved in decisions about their work can also strongly vary between occupations.

The aim of this dissertation is to test the DCS model, the ERI model and work ability in relation to employee well-being in three specific occupational groups: nurses and nursing aids, novice teachers, and Ph.D. students. Although the occupational context in which these groups function is considerably different, and therefore they are confronted with different stressors and coping resources, in our studies these context factors also remain in the background. Although we acknowledge the different contexts of the groups studied, the limitations



of our data prohibit a comparative analysis of contextual effects on the occupational stress model.

### ***1.3. Summary***

The conceptual model describes the pathways that links stressors experienced in a specific occupational context to employee well-being. Well-being refers to work-related well-being as well as to turnover intentions and sickness absence (see Figure 1.2). The occupational context is expected to mold the psychosocial work environment in which individuals operate. As a result of being embedded in a specific occupational context, individuals are confronted with a variety of stressors. Stressors are objective conditions (risk factors) that can affect individual well-being through the filter of individual perception. As a result of this filter, similar objective situations can be perceived as distressing by one person, while they can be neutral or even motivating for others. This indirect pathway, linking objective situations to stress outcomes through the filter of perception is described as the stress process. The work context does not only give rise to certain stressors but is also assumed to affect individual coping, as an individual's resources, such as social support, job control and rewards, may be largely restricted to a specific occupational setting.

Within a specific work setting, the supervisor plays a vital role. The supervisor's leadership style can not only be perceived as a stressor that has a direct effect on well-being, but it may also exert an indirect effect by its impact on other stressors and the individual's resources. Supervisors can for instance, impose a high workload and pace of work on their employees leading to increasing job demands. Additionally, supervisors can determine the amount of control an employee has to perform his/her tasks. Supervisors may also create a competitive work environment in which employees are competing instead of collaborating. This can have repercussions for the social support by co-workers. The rewarding aspect of the job may also be influenced by the supervisor. In this dissertation, we propose that the supervisor's leadership style will affect employees' job demands but also their coping resources (i.e. social support, reward, control).

The social stress process emphasizes that the individual plays an active role in dealing with stressful situations by constantly adapting strategies and actions (Pearlin et al., 1981). So, when confronted with stressors people are assumed to deal with them by implementing coping strategies that are either problem-focused or emotion-focused (Thoits, 1995). Coping strategies are situational solutions for specific conditions that are shaped by the available coping resources and coping styles. Coping resources, such as job control, the rewarding aspect of work, and co-worker and supervisor support, reflect a latent dimension of coping because they define a potential for action, but not the action itself (Gore, 1985). These resources are assumed to mediate or moderate the negative

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effects of the stressors on individual well-being. Coping styles refer to intrinsic characteristics of individuals, like learning motivation and over-commitment. These personal coping styles may be reinforced to some extent by specific circumstances in occupational life, most likely at early career stages (Levi et al., 2000). So, an individual experiencing stressors at work might initially engage in problem-focused coping such as reappraising the situation. If these efforts are unsuccessful in reducing the perceived stressors, psychological (e.g. poor work-related well-being) or behavioral (e.g. sickness absence) symptoms may manifest.

This conceptual model is presented as a static model, however it should be kept in mind that the social stress model is a dynamic process. The occupational context and the stressors and work conditions it brings with it cannot be separated from a broader overarching social structure.

### ***1.4. Empirical research papers***

The following empirical chapters are based on this conceptual model (see Figure 1.2). However, within the limits of the available data, not all subcomponents could be addressed in one single study. The papers in this dissertation are based on three distinct study samples of nurses and nursing aids, novice teachers and Ph.D. students. The context in which these three occupational groups operate is considerably different.

#### **1.4.1. The work environment of nurses and nursing aids**

Generally, nurses and nursing aids have a permanent contract, are often employed part-time and have good job opportunities as the demands for nurses has been increasing due to the ageing population and the rapid evolution of medical technologies (Coomber & Barriball, 2007; Simoens, Villeneuve, & Hurst, 2005). Nurses and nursing aids have a fixed work schedule, and often have atypical working hours that exceed the normal working hours (i.e. night work, early morning work, work in weekend and holidays, or rotating shifts) (Flinkman, Laine, Leino-Kilpi, Hasselhorn, & Salanterä, 2008). Healthcare workers are human service workers who work on a daily basis with 'clients'. In their work environment they are exposed to a variety of material and immaterial risk factors, ranging from physical demands due to the lifting of heavy patients (Dawson et al. 2005), to emotional demands due to stressful interactions with patients (e.g. aggressive patient) (Dormann & Zapf, 2004). Nurses and nursing aids typically work in a team under the supervision of a head nurse, who is their direct supervisor.

The nurses' supervisor and co-worker are important sources of social support as they can provide them with direct help, feedback, information and emotional support to deal with the demands at work (van der Heijden et al., 2010). However, the supervisor and co-workers may also be potential sources of stressors, for example in case of lack of support or bullying (Laschinger, Grau, Finegan, & Wilk, 2010). The nurses'

supervisor plays an important role in generating a favorable work climate by encouraging communication processes and by enabling employees to participate in decision-making (van der Heijden et al., 2010). Similarly, they also can reduce role ambiguity by assigning tasks, specifying procedures, clarifying expectations, and by providing predictability through work planning procedures (van der Heijden et al., 2010).

#### **1.4.2. The work environment of teaching professionals**

When young adults enter the labor force, they need to acquire new roles and statutes which can bring along a new array of stressors (Pearlin, 2010). In general, beginning teachers, but also Ph.D. students, are employees at the start of their career who have no or only limited work experience. Their inexperience may influence the way in which they perceive stressful situations and their ability to cope with such situations (Vandenberghe, Panaccio, Bentein, Mignonac, & Roussel, 2011; Barling et al., 2005). The first years of teaching are a challenging period. Beginning teachers are likely to experience different types of difficulties, for example, maintaining classroom discipline, fostering students' motivation, assessing students' work, and dealing with parents' meetings (Melnick & Meister, 2008). Autonomy is a typical aspect of the teaching job as the majority of teachers' work takes place in the classroom. However, the interactions with colleagues and the school principal are needed to prevent novice teachers from feeling isolated and for successfully accomplishing their teaching goals (Devos, Dupriez, & Paquay, 2012). Mentoring support and good relationships with co-workers and the principal are possible in a collaborative work environment. The school principal plays a vital role in creating such an environment. Another aspect of the school context that has to be kept in mind is the rewarding aspect of the job. Beginning teachers are likely to be employed on fixed-term contracts, and are consequently more susceptible to job insecurity. The possibilities for career development and promotion opportunities are also restricted in the teaching profession as the careers of teachers are generally characterized by a 'flat' career track.

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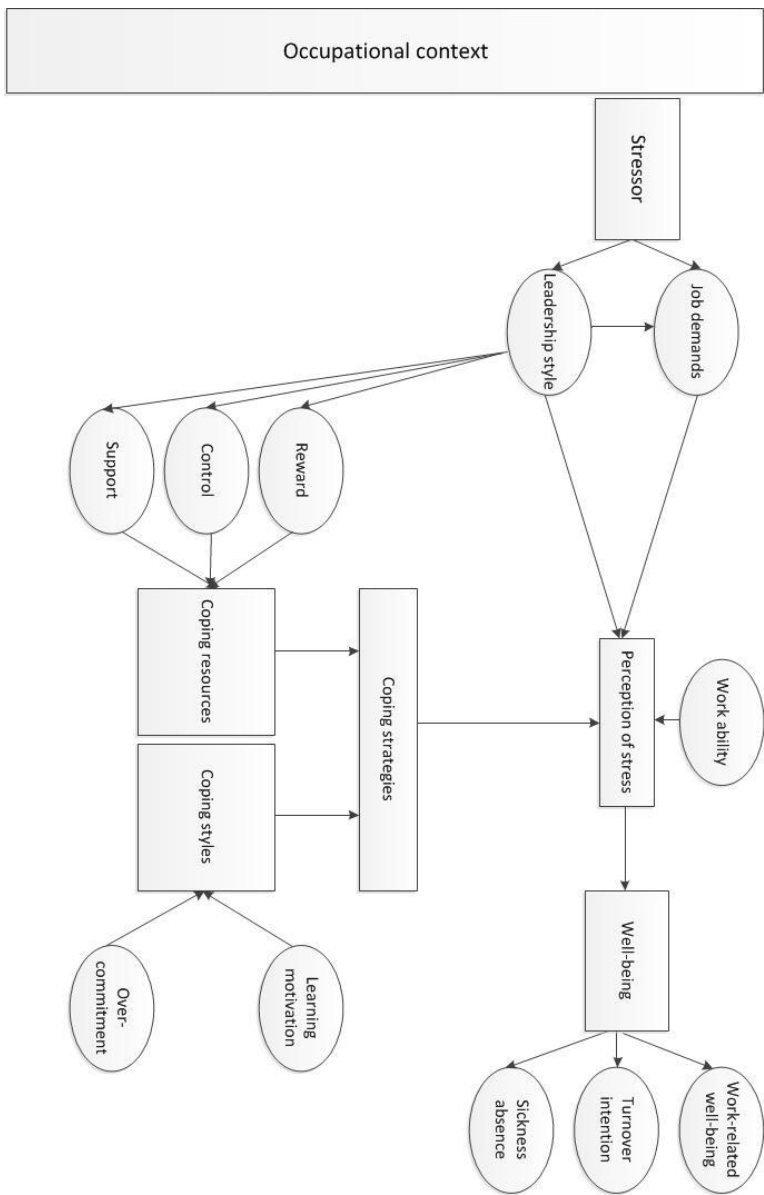


Figure 1.2. Conceptual model

### 1.4.3. The work environment of Ph.D. students

Employees within the three occupational groups are protected by the Belgian labour legislations with regard to working conditions and employment conditions such as working time and terms of dismissal. However, the Ph.D. production process itself has some characteristics of its own that might cause the actual work environment to diverge from the working and employment conditions protected by law. One such relevant characteristic concerns working time. Ph.D. students are informally expected to be intrinsically motivated and not to restrict their performance to the hours agreed on in their employment contract. This “informal” expectation often results in high workload and frequent overtime work. Such high job demands might however be compensated by the job control Ph.D. students experience, as they are trained to perform research autonomously making their own decisions. The variation in the amount of decision latitude granted to Ph.D.’s strongly depends on their supervisor. In Flanders, the Ph.D. supervisor is not only the academic mentor of the Ph.D. student, who is expected to guide and to support his/her students, but also their administrative supervisor, who decides about working arrangements (e.g. fixed working times, allowing working at home) and contract extensions, as fixed-term contracts are common in academia. Through their double status, Ph.D. supervisors have the power to determine to a large extent the work environment in which Ph.D. students work.

#### Overview chapters

The operational model of this dissertation is presented in Figure 1.3. The numbers matching the arrows correspond to the chapters in which these relations are tested. In the first two empirical studies presented in Chapter 3 and Chapter 4, the relation between occupational stress and turnover intention is explored among a sample of nurses and nursing aids, using a longitudinal design. In the first study, the effect of work ability and its change over time is investigated with regard to three types of turnover intentions (Chapter 3). In the second study, the ERI model is applied as a predictor of nurses’ intra-occupational and inter-occupational turnover intentions (Chapter 4). The ERI model was preferred above the DSC model as it has been suggested that the ERI model might have more power for explaining stress in the service occupations and professions, in particular the ones dealing with person-based interactions (such as nurses and teachers) (Marmot, Siegrist, Theorell, & Feeney, 1999).

For the same reason the ERI model was also used in the third study that deals with sickness absence among beginning teachers (Chapter 5). In this study, the overcommitment component was replaced by teachers’ learning motivation, for reasons that will be elucidated in Chapter 5. The study examines both effort-reward imbalance, learning motivation and their joint effect in relation to sickness absence. A distinction

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was made between absence frequency and absence duration to assess whether a failed reciprocity between efforts and rewards and a poor learning motivation can predict both type of outcomes.

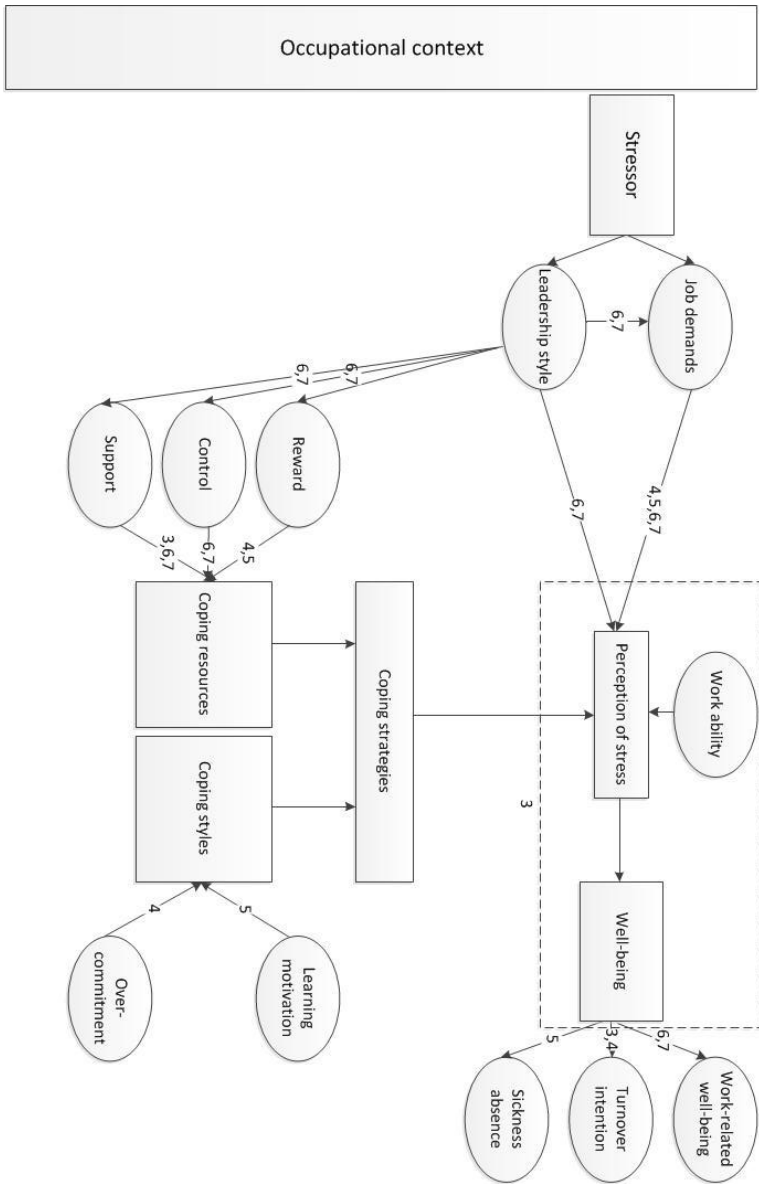


Figure 1.3. Operational model of the empirical research papers

The aim of the last two studies, presented in Chapter 6 and Chapter 7, was to investigate how the work-related well-being of Ph.D. students is affected by the leadership style of their supervisor, taking into account the student's psychosocial working conditions, in terms of job demands, control and co-worker support. In these studies, leadership style is considered as an important element of the psychosocial work environment that is not captured in the DCS model. The fourth empirical study investigates the effect of two types of leadership style and the interaction between both styles within a general sample of Ph.D. students (Chapter 6). In the fifth empirical study, the effects of a relationship-oriented and a task-oriented leadership style on work-related well-being are assessed for both male and female Ph.D. students (Chapter 7).

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## Chapter 2.      METHODOLOGICAL FRAME- WORK

The empirical testing of our conceptual model is based on three different datasets. Respectively, they inform about three distinct occupational groups: (1) healthcare workers, (2) novice teachers and (3) Ph.D. students. The dataset on healthcare workers is the so-called Belgian *WOQUAL study*, which forms part of a larger longitudinal European study (2.1). The data on beginning teachers was gathered in the *BelTeach study* (2.2). The data on Ph.D. students come from the *Survey of Junior Researchers*, which concentrates on young researchers in the Flemish part of Belgium (2.3). In this methodological chapter, more information is provided with regard to the three different datasets. For each dataset, we describe the respondent population and go more into detail about the operationalization of the most important independent and dependent variables that are used in the empirical papers, presented in Chapters 3 to 7. Chapters 3 and 4 are based on the data from the WOQUAL study, Chapter 5 is based on the data from the BelTeach study, and finally, Chapters 6 and 7 are based on the data from the Survey of Junior Researchers.

### **2.1. The WOQUAL study**

The WOQUAL (health and safety for work quality) study is a research project funded by the Belgian Federal Science Policy Office (Programme "Society and the Future", grant TA/00/33). The principal investigator of the research project was Prof. dr. William D'Hoore from Department of Public Health at the Université Catholique de Louvain. The study was conducted in collaboration with researchers from the Department of Public Health and the Department of Personnel Management, Work and Organization Psychology at Ghent University, researchers from the Department of Political and Social Sciences at the University of Namur, and researchers from the Department of Occupational Health at the University of Wuppertal.

The objective of this project was to further explore the longitudinal data of the Belgian sample from the Nurses Early eXiT study (NEXT) (Hasselhorn, Tackenberg, & Muller, 2003). The NEXT-study was financed by the European Union within the 5th framework programme (QLK6-CT-2001-00475) and was planned to investigate the reasons, circumstances and consequences surrounding premature departure from the nursing profession in ten European countries: Finland, France, Germany, United Kingdom, Italy, The Netherlands, Poland, Slovakia, Sweden and Belgium. For Belgium, a stratified sample of hospitals, home care services and long-term care was drawn based on the following criteria: (1) region (each of the three regions, Brussels, Wallonia and Flanders

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had to be represented), (2) status (private and public institutions had to be equally represented), (3) former restructuring (grouped and non-grouped institutions had to be represented). In total, 48 hospitals, home care services and nursing homes were randomly selected and invited to participate. Of those, 37 were finally included in the study. Characteristics of the sample are presented in Table 2.1. All participating institutions formally agreed upon their participation in a confirmation letter. The survey was introduced to the nursing staff by means of oral presentations. Advertising material in the form of a newsletter was distributed across the healthcare institutions in order to stimulate participation to the survey.

*Table 2.1. Overview of the participating institutions and staff in the baseline assessment*

Type of institution	n institutions	n staff approached	n staff responded	response rate
university hospital	2	1359	689	50.7%
hospital > 400 beds	2	1704	892	52.3%
hospital < 400 beds	12	1336	724	54.2%
nursing home	11	473	303	64.1%
home care	10	2075	1649	79.5%
<i>All</i>	<i>37</i>	<i>6947</i>	<i>4257</i>	<i>61.3%</i>

The design of the NEXT-study is presented in Figure 2.1. Between autumn 2002 and spring 2003, a first questionnaire was sent to the nursing staff of the participating healthcare institutions, including nursing aids, registered nurses and specialized registered nurses (baseline questionnaire: Q0). In the following 12 months, all those who were approached at the first assessment and had left their current healthcare institution were invited to fill in a second questionnaire (leavers questionnaire: LQ), investigating the reasons for this departure. One year after they had left the institution, the participants received a follow-up questionnaire (Leavers follow-up questionnaire LQ12) which investigated the effects and the consequences of this step. All participants who remained working in their institution were approached to fill in a second questionnaire 12 months after the initial baseline questionnaire (Stayers questionnaire: Q12). Each questionnaire was accompanied by a cover letter explaining the aims of the NEXT-study. Data comprise information regarding working conditions, work organization, social work environment, occupational and personal future perspectives, private background and psychological and physical health. The compiled baseline and stayers questionnaire were collected at each institution in a

sealed envelope and then delivered at the research institute. The leavers questionnaire and the leavers follow-up questionnaire were sent to the nursing staff's individual postal address, which resulted in a number of problems (e.g. incorrect postal addresses due to moving, lack of motivation to participate). A coding system, which assures participants' anonymity, was used for longitudinal follow-up as it enables the matching of two or more questionnaires from the same individual.

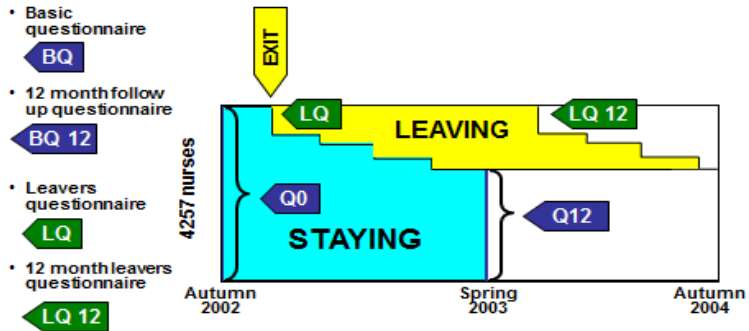


Figure 2.1. Design of the European Next-Study (Source: NEXT 2002).

In chapters 3 and 4 of this dissertation, analyses are restricted to data from the baseline and the stayers questionnaires. At baseline, a total of 4257 questionnaires, with an overall response rate of 61.3% were returned. The follow-up questionnaire (Q12), sent 12 months after baseline, was completed by 2857 participants, leading to a response rate of 48.0%. In the follow-up questionnaire, the majority of baseline questions were repeated and additional information reflecting changes in the past twelve months were asked (i.e. changes in working hours, work load, job position, etc.). The follow-up questionnaire also included questions on reasons for staying. A coding system was used which allows to match the baseline questionnaire and the follow-up questionnaire. We identified 1531 participants who remained working in their organization during the 1-year follow-up. This subsample forms the basis for our studies in chapters 3 and 4. For a description of the socio-demographic characteristics of the respondents we refer to Table 2.2. The large majority of the respondents were women (92.5%). The nursing staff members in this study were mostly employed in home care organizations (49.3%) or hospitals (44.7%), only a minority worked in nursing homes (6.0%). The mean age of respondents was 38.4 years and the average work experience within the nursing profession was 15.3 years.

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*Table 2.2. Socio-demographic characteristics of the respondents (n=1531)*

Variables	Category	n	%	Mean (SD)
Age				38.4 (8.8)
Seniority in nursing profession				15.3 (8.7)
Seniority in current organization	≤ 1 year	111	7.3	
	1-5 years	276	18.1	
	≥ 5 years	1139	74.6	
	Missing	5		
Type of health care organization	Hospitals	684	44.7	
	Nursing Home	92	6.0	
	Home Care	755	49.3	
Type of health care training	Nursing Aid	108	7.2	
	Registered Nurse	1089	73.1	
	Specialized Registered Nurse	294	19.7	
	Missing	40		
Gender	Male	115	7.5	
	Female	1416	92.5	
Family situation	Living alone	139	9.2	
	Only adult with children	75	5.0	
	Living with another adult	357	23.7	
	Living with another adult and children	936	62.1	
	Missing	24		
Number of working hours a week	< 19 h	121	8.1	
	≥ 19 and < 38 h	757	50.7	
	≥ 38 h	614	41.2	
	Missing	39		
Work schedule	Day work regular hours	372	24.5	
	Day work others	268	17.7	
	Only night shift	72	4.7	
	Shift work without night	467	30.8	
	Shift work with night	337	22.3	
	Missing	15		



2.1.1. Operationalization of the independent variables

Work ability

Work ability was measured by the Work Ability Index (WAI) (Tuomi et al. 1998). The WAI has been translated into 25 languages and is widely used in epidemiological studies (Ilmarinen & Tuomi, 2004). The WAI is an assessment of the ability of a worker to perform his/her job, taking into account the worker’s specific psychosocial and physical work-related factors, mental and physical capabilities, and health (van den Berg et al., 2008). The index consists of an individual’s assessment of the physical and mental job demands, diagnosed diseases, limitations in work due to disease, sick leave, work ability prognosis, and psychological resources (Tuomi et al. 1998). These seven dimensions are presented in Table 2.3. These dimensions are assessed by means of 26 items (See Appendix 1 for a description of the items). The WAI is derived as the sum score of the ratings of each dimension (Tuomi et al. 1998). The range of the summative index is 7-49, with higher scores indicating higher perceived work ability. Based on this WAI score, the individual’s work ability can be classified into four different categories: poor (values 7–27), moderate (values 28–36), good (values 37–43) and excellent (values 44–49) (Alavinia, de Boer, van Duivenbooden, Frings-Dresen, & Burdorf, 2009; Ilmarinen, Tuomi & Klockars, 1997; Liira et al., 2000; Tuomi et al., 1998). The Cronbach’s alpha for this scale was 0.68.

Table 2.3. Dimensions of WAI

Dimension	Scoring range
Current work ability compared with optimal life time performance	0-10
Work ability in relation to the physical and mental work demands	2-10
Number of current diseases diagnosed by a physician	1-7
Subjective estimation of working impairment due to diseases	1-6
Self-rated sickness absenteeism during the past year	1-5
Personal prognosis of work ability in next 2 years	1,4,7
Mental resources (referring to the workers’ life in general, both at work and during leisure time)	1-4
Total score	7-49

The internal validity of the WAI has been established, showing a satisfactory relationship between the subjective results of the WAI and the results of more objective measurements (i.e. medical examinations) (Eskelinen, Kohvakka, Merisalo, Hurri, & Wagar, 1991; Nygard, Huuhtanen, Tuomi, & Martikainen, 1997). Furthermore, satisfactory test-retest reliability of the WAI has been demonstrated (de Zwart, Frings-Dresen, & van Duivenbooden, 2002). Radkiewicz and Widerszal-Bazyl (2005) have assessed to the psychometric properties of the WAI, based on the total sample of the NEXT-study, including nurses and nursing aids from the 10 participating countries. Their study showed that WAI reveals a high level of cross-national stability. Comparative analyses

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showed similar internal reliability and pattern of factor structure (Radkiewicz & Widerszal-Bazyl, 2005). The Cronbach’s alpha for the total sample of the NEXT-Study amounted to 0.72 (Radkiewicz & Widerszal-Bazyl, 2005).

Social support

The degree of social support nurses received from their supervisor and their colleagues was measured by two 4-item scales (see Table 2.4). These scales were developed by van der Heijden (2002, 2003). Response categories for the first three questions ranged from 1 (never) to 5 (often). For the last question they ranged from 1 (shows little willingness to help me) to 5 (is very willing to help me) (Kümmerling et al., 2003). The Cronbach’s alpha for the co-worker support scale was 0.72 and 0.80 for the supervisor support scale. These Cronbach’s alpha’s for the support scales were similar to the Cronbach’s alpha’s of the other participating countries (Kümmerling et al., 2003; van der Heijden et al., 2010). The scale variables are constructed as the mean scores of the items, one missing item per participant was allowed (Kümmerling et al., 2003). In case of one missing, the means score was calculated based on three item scores. Cases with more missing values were excluded from further analysis (Kümmerling et al., 2003).

Table 2.4. Items of the social support scale

Items	Scoring range
<b>Co-worker support</b>	1-5
Are your colleagues able to appreciate the value of your work and its results	
Do your colleagues express an opinion on your work	
Do your colleagues give you supportive advice	
In general, are your colleagues ready to help you with the performance of your tasks	
<b>Supervisor support</b>	1-5
Is your supervisor able to appreciate the value of your work and its results	
Does your supervisor express an opinion on your work	
Does your supervisor give you supportive advice	
In general, is your supervisor ready to help you with the performance of your tasks	

Interpersonal relations

The quality of the interpersonal relations was assessed by a 5-item scale (see Table 2.5.), developed by the NEXT-study group (Hasselhorn et al., 2003). Respondents were asked to indicate how they perceived the relations between the nursing staff and five relevant groups within their organization. The answer categories ranged from (1) hostile to (5) friendly and relaxed. The mean score was calculated to create a single interpersonal relations score. No missing items were allowed (Kümmerling et al.,

2003). The Cronbach’s alpha for this scale was 0.69, and was comparable to the scores of the other participating countries (Kümmerling et al., 2003).

Table 2.5. *Items of the interpersonal relations scale*

Items	Scoring range
<i>How do you perceive the relations between the nursing staff and</i>	1-5
Nursing management	
Head nurse	
Colleagues	
Physicians	
Administration	

Effort-Reward Imbalance (ERI) model

In the second empirical paper (see Chapter 4), the ERI model was tested in relation to turnover intention. The ERI model is based on three constituent components: effort, reward and overcommitment. Measurement of the three components are based on a standardized questionnaire containing 23 Likert-scaled items, develop by Siegrist et al. (2004).

Effort

Effort was assessed by 6 items measuring demanding aspects of the work environment (see Table 2.6). Responses are scored on a 5-point scale where a value of 1 indicates no respective stressful experience, and a value of 5 indicates a very stressful experience (Siegrist et al., 2004). Items are answered in two steps. In a first step, respondent have to indicate whether a given type of (stressful) condition at work exists, by choosing between two response categories: “no” or “yes”. If they agreed, participants had to evaluate in the second step, to what extent they perceive this condition as stressful on a 4-point scale ranging from 1 (“not stressful”) to 4 (“very stressful”). The overall effort score was ranging from 6 to 30. The higher the score, the higher the efforts. The Cronbach’s alpha for this subscale was 0.72, in line with the Cronbach’s alpha’s found in the other participating countries (Kümmerling et al., 2003; Li et al., 2011).

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Table 2.6. Items of the effort scale

Items	Scoring range
I am under constant time pressure due to the heavy work load	1-5
I have many interruptions and disturbances in my job	1-5
I have a lot of responsibility in my job	1-5
I am often pressured to work overtime	1-5
My job is physically demanding	1-5
Over the past few years, my job has become more and more demanding	1-5
<i>Total score</i>	<i>6-30</i>

### Reward

Rewards were measured using 11 items, covering different rewards: financial and career-related aspects of rewards, esteem rewards, and rewards in the domain of job security (see Table 2.7). Similar to the effort scale, these items were answered in two steps and scored on a 5-point scale (Siegrist et al., 2004). The overall reward score varied between 11 and 55. The higher the score, the more rewards the job offers. The Cronbach's alpha for the reward scale was 0.80. This Cronbach's alpha was similar to those in the other participating countries (Kümmerling et al., 2003; Li et al., 2011).

Table 2.7. Items of the reward scale

Items	Scoring range
<b><i>Salary and career opportunities</i></b>	
My job promotion prospects are poor	1-5
My current occupational position adequately reflects my education and training	1-5
Considering all my efforts and achievements, my work prospect are adequate	1-5
Considering all my efforts and achievement, my salary/income is adequate	1-5
<b><i>Esteem</i></b>	
I receive the respect I deserve from my superiors	1-5
I receive the respect that I deserve from my colleagues	1-5
I experience adequate support in difficult situations	1-5
I am treated unfairly at work	1-5
Considering all my efforts and achievement, I receive the respect and prestige I deserve at work	1-5
<b><i>Job insecurity</i></b>	
I have experienced or I expect to experience an undesirable change in my work situation	1-5
My job security is poor	1-5
<i>Total score</i>	<i>11-55</i>

*Effort-Reward Imbalance*

Several formulations exist to operationalize the co-occurrence of efforts and rewards, such as the discrepancy (i.e., relative excess), the interactive (i.e., multiplicative interaction), and the proportional form (i.e. ratio term) (van Vegchel, de Jonge, & Landsbergis, 2005). In this dissertation, we used the main recommended formulation of ERI, namely the ratio term (Siegrist & Peter, 1996). The ratio was computed by placing the effort score in the numerator and the reward score in the denominator. The reward score has to be multiplied by a correction factor (.5454) because of an unequal number of items in the numerator and denominator (6/11). A value close to zero indicates a favourable condition (relatively low effort, relatively high reward), whereas values beyond 1.0 indicate a critical condition of high costs (efforts) and low gain (rewards). The ratio can be either used as a continuous variable or can be transformed into a binary variable (values  $\leq 1$  vs.  $>1$ ) (Siegrist al., 2004). In our study sample, the prevalence of a ratio above 1 at baseline was 4.4%. Due to this low prevalence, our formulation of ERI may diminish statistical power. As suggested by Niedhammer, Tek, Starke, and Siegrist (2004), based on the continuous variable, quartiles were defined in order to obtain dose-response associations between ERI and the outcome variables. Consistent with other researchers (Godin, Kittel, Coppieters, & Siegrist, 2005; Kuper, Singh-Manoux, Siegrist, & Marmot, 2002) we used the upper quartile of the distribution of the ERI ratio in order to define the people at risk.

*Overcommitment*

Overcommitment is a personal characteristic and refers to the inability to withdraw from work obligations and the strong need for esteem and approval. The scale consists of six items (see Table 2.8). Each item consists of four answer categories, ranging from "strongly disagree" to "strongly agree". The total score was varying between 6 and 24. The higher the score, the more likely an individual is overcommitted. The Cronbach's alpha for this scale was 0.78, in line with the Cronbach's alpha's found in the other participating countries (Kümmerling et al., 2003, Li et al., 2011).

*Table 2.8. Items of the overcommitment scale*

Items	Scoring range
I get easily overwhelmed by time pressures at work	1-4
As soon as I get up in the morning I start thinking about work problems	1-4
When I get home, I can easily relax and "switch off" from work	1-4
People close to me say I sacrifice too much for my job	1-4
Work rarely lets me go, it is still on my mind when I go to bed	1-4
If I postpone something that I was supposed to do today I'll have trouble sleeping at night	1-4
<i>Total score</i>	6-24

### 2.1.2. Operationalization of dependent variables

#### Turnover intentions

In the first empirical study (see Chapter 3), a distinction was made between within-organizational turnover intention, intra-occupational turnover intention and inter-occupational turnover intention. All three outcomes were measured by a single question (Hasselhorn et al. 2003): "How often have you respectively thought during the course of the past year about" (1) changing wards in the same organization (i.e. intent to leave the ward); (2) leaving the current institution (i.e. intent to leave the organization); and (3) giving up nursing and starting a different kind of job (i.e. intent to leave the profession). The answer categories comprised "never", "sometimes a year", "sometimes a month", "sometimes a week", and "every day". The turnover intention outcomes were dichotomised. Thinking at least several times a month about leaving was considered as a high intent to leave.

In the second empirical study (see Chapter 4), we distinguished between intra-occupational turnover intention and inter-occupational turnover intention. Intra-occupational turnover intention was measured by one single question: "How often do you think about leaving the current institution" (Kinnunen, Feldt, & Makikangas, 2008). The answer categories ranged from "never" to "every day". Thinking sometimes a month or more often about leaving the current institution was considered as a high ITL organisation.

In line with previous research, inter-occupational turnover intention of nurses was measured by three items based on one general question: "How often do you think about" (1) further qualification outside nursing; (2) giving up nursing; (3) giving up nursing and starting a different kind of job (Widerszal-Bazyl et al., 2008). Each item had five answer categories, ranging from "never" to "every day". Participants indicating thinking about the content of at least one item several times a month or more, were considered having a high ITL profession, whereas considering leaving a couple of times a year could be seen as natural for most professionals (Hasselhorn et al., 2003). The Cronbach's alpha for this 3-item scale was 0.74.

## 2.2. *The BelTeach Study*

The objective of the BelTeach study was to gather information about the motivation of teacher education graduates to enter the teaching profession, the health-related risk factors beginning teachers encounter, and their psychological well-being. Data were collected as part of research programme (BOF 01102503), a study supported by the Special Research Fund at Ghent University. The principal investigators were Prof. dr. Antonia Aelterman from the Department of Educational Studies, and Prof. dr. Peter Vlerick from the Department of Personnel Management, Work and Organizational Psychology at Ghent University. This

study was conducted among graduates from all eight teacher training institutes affiliated to the Ghent University Association<sup>1</sup>. All types of initial teacher training existing in Flanders were considered: teacher training for pre-school education, primary school education, lower secondary school education (provided by institutes of higher education, the so-called university colleges), upper secondary school education (academic teacher training) and teacher training in adult education centres.

*Table 2.9. Socio-demographic characteristics of the respondents (N=603)*

Variable	Category	n	%	Mean (SD)
Age				26.5 (5.7)
Seniority in teaching profession				2.3 (2.2)
Gender	Male	143	23.7	
	Female	460	76.3	
Education level	Higher education for social promotion	35	5.8	
	Bachelor degree	359	59.5	
	Master degree	200	33.2	
	Missing	9		
Family situation	Living with partner	315	52.2	
	Living alone	74	12.3	
	Living with family/friends	214	35.5	
Work situation	Full-time	515	85.5	
	Part-Time	87	14.5	
	Missing	1		
Working contract	Permanently appointed	22	3.7	
	Partially appointed	34	5.7	
	Temporary contract	543	90.7	
	Missing	4		
Education type	Nursery school	45	7.6	
	Elementary school	157	26.6	
	Secondary school	361	61.6	
	Other	25	4.2	
	Missing	15		

<sup>1</sup> The teacher education institutes involved in the BelTeach study are University College Ghent (Hogeschool Gent), University College Arteveldehogeschool, University College West Flanders (Hogeschool West-Vlaanderen), Centre for Adult Education IVO Bruges, Centre for Adult Education CVO HIPB-KISP, Centre for Adult Education – IVV de Avondschool, Mercator Provincial Centre for Adult Education, and Ghent University.

## Methodological framework

A survey was sent out in autumn 2004 to all 4735 teacher education graduates who qualified between 2002 and 2004. The survey covers many topics, including educational history, the initial teacher training, the employment situation, the psychosocial work environment, and well-being. A total of 1756 respondents returned the survey (37.1% response rate). The participants were also asked to give their consent to gather additional data on their sickness absence during the 12 months following to the baseline assessment. For the teachers who remained working during this follow-up period, objective registered sickness absence data could be obtained from the personnel database of the teachers' employer, namely the Flemish Ministry of Education and Training (Vlaams Ministerie voor Onderwijs en Vorming). Teachers were guaranteed that their information would be processed confidentially.

For the 776 participants, who worked as a teacher during the baseline assessment and who stayed working in the teaching profession during the 1-year follow-up, sickness absence data were gathered. For 108 of them, no complete sickness absence data could be collected, and they were excluded from further analyses. Another 65 respondents were excluded because they did not give an informed consent to obtain their sickness absence data. Finally, for a sample of 603 beginning teachers, the absenteeism data could be linked to the baseline questionnaire data by means of a unique code. The third empirical study presented in Chapter 5 is based on this final dataset. A description of the socio-demographic characteristics of the respondents is presented in Table 2.9. Most of the respondents were female (76.3%). The mean age of the respondents was 26.5 years and the average work experience was 2.3 years. The large majority of the novice teachers in this sample were employed on a temporary basis (90.7%), only 3.7% had a permanent appointment. Teacher graduates with a degree on bachelor level were best represented in the sample (59.5%), followed by teachers holding a master degree (33.2%).

### 2.2.1. Operationalization of independent variables

In the third empirical study (see Chapter 5) the Effort-Reward Imbalance model was tested in relation to sickness absence.

#### Effort-Reward Imbalance model

##### *Effort-Reward Imbalance*

The standardized ERI questionnaire, developed by Siegrist et al. (2004), was applied to measure the effort and reward component of the ERI model. For a description of the scale items we refer to the beginning of this chapter (see 2.1.1.). The sum score was calculated for both scales. The Cronbach's alpha for the effort and reward scale were 0.59 and 0.74 respectively. The validity of the ERI model to describe the dimensions involved in teacher's stress in school teachers has been confirmed (Zurlo, Pes, & Siegrist, 2010).



The main recommended formulation to calculate ERI was applied, namely the ratio term of the effort score divided by the reward score, taking into account a correction factor (.5454) because of the unequal number of items in the nominator and denominator (6/11) (Siegrist & Peter, 1996). A value close to 0 indicates a favorable condition (relatively low effort, relatively high reward), whereas values beyond 1.0 indicate a critical condition of high costs (efforts) and low gain (rewards). The ratio can either be used as a continuous variable or be transformed into a binary variable (values  $\leq 1$  vs.  $>1$ ) (Siegrist et al., 2004). In our study sample, the prevalence of a ratio above 1 at baseline was 6.3%. Because of this low prevalence, our formulation of ERI may diminish statistical power. In line with Head et al. (2007), based on the continuous variable, tertiles were defined ranging from ‘low’ to ‘medium’ and ‘high’. The respondents in the high ERI group were defined as the people at risk.

In the third study, the overcommitment component was substituted by learning motivation (see Chapter 5).

*Learning motivation*

Learning motivation was measured by the Learning Motivation scale developed by Taris et al. (2003) and refers to the degree to which employees are enabled and stimulated to acquire new knowledge and skills and to solve problems in their job. This scale consists of three items scored on a 4-point Likert-scale, ranging from (1) never to (4) always (see Table 2.10). Two items assessed the degree to which participants were actively looking for situations in which they could expand their skills. A third item measured whether the participants were willing to invest time and effort in dealing with difficult situations, which is a precondition for acquiring new skills. The Cronbach’s alpha for this scale was 0.62. Similar Cronbach’s alpha’s were found for the learning motivation scale among a sample of Dutch teachers by Taris, Kompier, De Lange, Schaufeli, and Schreurs (2003).

*Table 2.10. Items of the learning motivation scale*

Items	Scoring range
I am constantly looking for new challenges in my job	1-4
I spend much energy in keeping up with recent developments	1-4
When things seem to go wrong, I increase my efforts and keep on trying	1-4

**2.2.2. Operationalization of dependent variables**

**Sickness absence**

Absenteeism is defined as the failure to report for scheduled work (Johns, 2002) and has been operationalized in a variety of ways (Darr & Johns, 2008). Records-based or self-report indices of absence frequency (number of times absent), and time lost absence (total number of days

## Methodological framework

absent) are the most commonly used individual-level measures of absenteeism (Darr & Johns, 2008). In this dissertation, objective sickness absence data were obtained from the teachers' employer during the one year follow-up period. Sickness absence was registered by the Department of Education of the Ministry of the Flemish Community that is authorized to register all sickness absences for teachers employed in schools from the Flemish Community. Only absence from work due to sickness was considered; pregnancy and maternity leaves were not included. Information on both sickness absence duration (the total number of sick leave days) and frequency (the total number of sick leave episodes) were collected (see Chapter 5).

Measuring sickness absence by the means of objective, administrative data differs from the approach of well-known surveys like the WHO (World Health Organization) Questionnaire and the SERV (Sociaal-Economische Raad van Vlaanderen) questionnaire (Kessler et al., 2004; Bourdeaud'hui, Janssens & Vanderhaeghe, 2004). In these questionnaires sickness absence is measured by means of self-assessments. Our approach considerably differs from the operationalization used by the WHO. The WHO applies two ways of measuring and scoring absenteeism. One relies on the respondent estimating how many hours he/she worked over a four-week period. In a second question, the respondent is asked to estimate how many hours he/she worked in the past 7 days (Kessler et al., 2004). However, the operationalization of sickness absence used in the SERV questionnaire 2013 is similar to ours. This survey also distinguishes between sickness absence and sickness frequency, but sickness frequency is rated on an ordinal scale (Bourdeaud'hui & Vanderhaeghe, 2013). Respondents are asked to indicate how many times they had been absent during the last 12 months due to illness or accidents. The answer categories were as follows: (1) zero times, (2) 1 time, (3) 2 times, (4) 3 or 4 times, (5) 5 times or more. Additionally, respondents were asked to rate the total number of days they had been absent during the past 12 months due to illness or accidents.

### ***2.3. Survey of Junior Researchers I***

The Survey of Junior Researchers (SJR) I was organized between March and October 2008 by the Centre for Research and Development Monitoring Ghent (ECOOM-UGent, 2008) at the universities of Ghent (UGent), Brussels (VUB), Antwerp (UA) and Hasselt (UHasselt) under the supervision of the principal investigator Prof. dr. Ronan Van Rossem. Based on the administrative personnel databases of each university, 5976 junior researchers could be identified, who were defined as 'non-doctorate holding research staff'. All of them were invited to complete the web-survey either in Dutch or in English. In total, 2599 junior researchers participated. The overall response rate was 43.5%. The data captures the views of doctoral candidates on various topics regarding their current and future (research) careers: their doctoral research, the

support of their supervisor(s), the amount of intersectoral collaboration, work satisfaction, international mobility and career plans. In order to limit the number of questions included in the survey, administrative personnel and student data were supplemented to the questionnaire data. The data were afterwards anonymously processed. An analysis of the response rates showed that there were differences according to the gender, nationality, discipline, junior category and the university of the respondents. For more in depth information on the response rates we refer to the report of the Survey of Junior Researchers (Leyman et al., 2009).

A description of the socio-demographic characteristics of the respondents is presented in Table 2.11. Men and women were almost equally represented in the sample. Almost 80% of the respondents had the Belgian nationality. Two thirds of the respondents were Ph.D. students in one of ‘Science and Technology’ disciplines, one out of five worked as a doctoral student in the social sciences, and 14.1% had position as junior researcher in the humanities. The majority of respondents had an appointment as teaching assistant, bursary or junior researcher with a labor contract. These appointments are aimed at obtaining a doctoral degree. In total, 1887 respondents were enrolled in a Ph.D. program and were performing research with the objective to obtain a doctoral degree. The fourth and fifth empirical study are based on this sample of junior researchers (see Chapters 6 and 7).

Table 2.11. *Socio-demographic characteristics of the respondents (N=2599)*

Variable	Category	n	%
Gender	Women	1251	48.9
	Men	1309	51.1
	Missing	39	
Nationality	Belgian	2029	79.5
	Non-Belgian	524	20.5
	Missing	46	
University	UGent	1125	43.3
	VUB	721	27.7
	UA	605	23.3
	UHasselt	148	5.7
Discipline	Humanities	367	14.4
	Social sciences	512	20.1
	Natural sciences	640	25.1
	Applied sciences	469	18.4
	Biomedical sciences	559	21.9
	Missing	52	

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Variable	Category	n	%
Junior (sub)categories			
	Teaching assistant	422	16.5
	Bursaries	943	37.0
	Bursaries FWO-Vlaanderen	241	9.5
	Bursaries IWT-Vlaanderen	173	6.8
	Fellows with a labour contract	396	15.5
	Researchers without the objective to obtain a Ph.D.	81	3.2
	Bursaries without labour contract or student status	294	11.5
	Missing	49	
Current situation*			
	Still working to obtain a doctorate	1887	83.6
	Is not yet enrolled in a Ph.D. program	150	6.6
	Already obtained a doctorate	105	4.7
	Is not interested in obtaining a doctorate	65	2.9
	Stopped pursuing a doctorate	51	2.3
	Missing	302	

\*Percentages were calculated on a sample of 2560 respondents excluding those respondents who had missing gender data

### 2.3.1. Operationalization of independent variables

In the fourth and fifth empirical study (see Chapters 6 and 7), the effect the supervisor's leadership style on Ph.D. students' work-related well-being was investigated by considering the students' psychosocial working conditions in terms of job demands, job control and co-worker support, as possible mediating variables.

#### Demand-Control-Support (DCS) model

The three subscales of the DCS model were derived from the Short Inventory to Monitor Psychosocial Hazards (SIMPH) (Notelaers, De Witte, Van Veldhove, & Vermunt, 2007). Job demands were operationalized by four items measuring the pace of work and conflicting demands (see Table 2.12). Job control was measured by eight items representing skill use, decision authority, and the variety of the work (see Table 2.13). Social support from colleagues was measured by two items referring to the helpfulness and the esteem received from colleagues (see Table 2.14). All items of these three scales were scored on a 4-point Likert-scale ranging from (1) never to (4) always. The Cronbach's alpha for the demand and control scale were 0.63 to 0.73, respectively. Mean scores are calculated for each scale.

*Table 2.12. Items of the demand scale*

Items	Scoring range
Do you have to work extra hard in order to complete something?	1-4
Do you work under time pressure?	1-4
Do you have to hurry?	1-4
Do you receive contradictory instructions?	1-4

*Table 2.13. Items of the control scale*

Items	Scoring range
Does your work make sufficient demands on all your skills and capacities?	1-4
Is your work varied?	1-4
Do you learn new things in your work?	1-4
Does your work give you the feeling that you can achieve something?	1-4
Can you participate in decisions affecting issues related to your work?	1-4
Does your work require personal input?	1-4
Do you have a lot to say over what is going on in your work area?	1-4
Can you consult satisfactorily with your supervisor about your work?	1-4

*Table 2.14. Items of the co-worker support scale*

Items	Scoring range
In your work, do you feel appreciated by your colleagues?	1-4
If necessary can you ask your colleagues for help?	1-4

## Leadership style

The leadership style of the supervisor was measured by 21 items. Ph.D. students were asked to indicate how strongly they agree with these 21 statements concerning the leadership style of their main supervisor. The items were rated on a 6-point Likert-scale ranging from (1) totally disagree to (6) totally agree. A factor analysis with varimax rotation was conducted on these items in order to identify the underlying concepts. Based on this analysis, two factors were discerned. These two factors were relationship-oriented leadership style and task-oriented leadership style and explain 58% of the variance. All items loaded as expected, 15 items loaded on factor 1 and six items loaded on factor 2. Items regarding the task-oriented leadership style loaded 0.70 or higher, whereas items regarding the relationship-oriented leadership style loaded at least 0.46. Table 2.15 presents the different items for both factors, the factor loadings after rotation, and the explained variance and eigen values.

Both leadership style scales were constructed as the mean scores of the items. The total score for both scale varied between 1 and 6. The higher the score, the more likely the Ph.D. supervisor is perceived as either

## Methodological framework

strongly task-oriented, or strongly relationship-oriented. The Cronbach's alpha for task- and the relationship-oriented leadership style scale was 0.86 and 0.94, respectively.

Table 2.15. Factor loadings for the different leadership style dimensions

Leadership style scale items		Factor 1	Factor 2
1	Is generally a good supervisor	<b>0.866</b>	0.279
2	Advises me about the development of my project	<b>0.857</b>	0.129
3	Regularly discusses my research with me	<b>0.835</b>	0.064
4	Makes relevant suggestions	<b>0.819</b>	0.269
5	Helps me with the preparation of publications	<b>0.796</b>	0.095
6	Knows how to enthuse me	<b>0.743</b>	0.342
7	Brings me into contact with other researchers	<b>0.732</b>	0.165
8	Is critical in a constructive way regarding my work	<b>0.723</b>	0.309
9	Follows carefully the scientific literature concerning my subject	<b>0.711</b>	-0.104
10	Does not know much about my research subject	<b>-0.687</b>	-0.057
11	Is sufficiently available	<b>0.666</b>	0.158
12	Keeps track of my work plan	<b>0.638</b>	-0.074
13	Leaves me to my fate (he/she does not help me at all)	<b>-0.632</b>	-0.145
14	Stimulates me to go to conferences	<b>0.593</b>	0.328
15	Stimulates research visits abroad	<b>0.462</b>	0.262
16	Forces his/her opinion on me	-0.195	<b>-0.818</b>
17	Gives me enough freedom concerning the content of my project	0.171	<b>0.765</b>
18	His/her word is law	-0.096	<b>-0.764</b>
19	Determines the course of my project in too much detail	0.154	<b>-0.743</b>
20	Always thinks that he/she knows better	-0.225	<b>-0.736</b>
21	Gives me enough freedom concerning the methodology of my research	0.243	<b>0.698</b>
Initial eigen value		9.154	3.025
Explained variance		43.590	14.407
Cumulative explained variance		43.590	57.997

Source: SJR, own calculations

### 2.3.2. Operationalization of the dependent variables

#### Work-related well-being

Work-related well-being is a latent variable, composed of three well-being aspects: job satisfaction, pleasure at work and need for recovery after work. The standardized factor loadings for the general sample were 0.76 for job satisfaction, 0.78 for pleasure at work and -0.34 for need for recovery after work (see Chapter 6). The standardized factor loadings of these three well-being aspects for men were: 0.75 for job satisfaction, 0.76 for pleasure at work and -0.34 for need for recovery after work, and for women: 0.79 for job satisfaction, 0.80 for pleasure at work and -0.33 for need for recovery (see Chapter 7).

Job satisfaction is represented by a single question: "To what extent are you in general satisfied with your current job?". Possible answers

range from (1) very dissatisfied to (6) very satisfied. Previous research suggested that single-item measures can be acceptable indicators of satisfaction (Wanous et al. 1997).

Pleasure at work is measured by the mean score on five items (see Table 2.16). Possible answers ranged from (0) never to (3) always. The Cronbach’s alpha for the pleasure at work scale was 0.83.

Table 2.16. *Items of the pleasure at work scale*

Items	Scoring range
I do my work because I have to, and that says it all	0-3
Mostly, I am pleased to start my day’s research	0-3
I still find my work stimulating, each and every day	0-3
I have to continually overcome my resistance in order to do my work	0-3
I enjoy my work	0-3

The degree of need for recovery after work was also assessed as the mean score of five items (see Table 2.17). The answer categories ranged from (0) never to (3) always. The Cronbach’s alpha for this scale was 0.83.

Table 2.17. *Items of the need for recovery scale*

Items	Scoring range
I find it difficult to relax at the end of a working day	0-3
Because of my job, at the end of the working day I feel rather exhausted	0-3
I find it difficult to concentrate in my free time after work	0-3
Generally, I need more than an hour before I feel completely recuperated after work	0-3
A feeling of tiredness prevents me from doing my work as well as I normally would during the last part of the working day	0-3

2.4. Self-reports

Mainly self-report measures were used in all three datasets for practical reasons, as they allow gathering large amounts of data in a relatively fast and inexpensive way. However, it should be mentioned that measuring job characteristics and employee well-being only with self-report questionnaires may lead to common method variance. That is, trivial correlations may be observed due to methodological overlap between independent and dependent measures. Nonetheless, Spector (2006) stated that these influences are not as high as could be expected. It has also been suggested that the use of self-report measures for both exposure and outcome variables is less problematic when there is a prospective design (Tennant, 2001; Theorell & Hasselhorn, 2005). This was the case for two empirical research articles based on the sample of healthcare workers (see Chapter 3 and 4). Another possible solution to obtain adequate information about job characteristics or employee well-being is by

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including objective measures or information from other sources than the respondent (Frese & Zapf, 1988). In the third empirical research paper, objective sickness absence data registered by the employer was included as an objective outcome measure (see Chapter 5).

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# **Part II**

## **Empirical studies**



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## **Chapter 3. PERCEIVED WORK ABILITY AND TURNOVER INTENTIONS: A PROSPECTIVE STUDY AMONG BELGIAN HEALTHCARE WORK- ERS**

Derycke, H., Clays, E., Vlerick, P., D’Hoore, W., Hasselhorn, H. M., & Braeckman, L. (2012). Perceived work ability and turnover intentions: a prospective study among Belgian healthcare workers. *Journal of Advanced Nursing* 68(7), 1556-1566.

## **Perceived work ability and turnover intentions: a prospective study among Belgian healthcare workers**

### ***Abstract***

**Aim:** Exploring the prospective relations between nurses' perceived work ability and three forms of turnover intentions, respectively, intent to leave the ward, intent to leave the organization and intent to leave the profession.

**Background:** Turnover of nursing staff is a major challenge for healthcare settings and for healthcare in general, urging the need to improve retention.

**Methods:** Based on the longitudinal data of the Belgian sample from the European Nurses' Early Exit study, a total of 1531 healthcare workers who remained in their job, completed in 2003 and 1 year later a self-administered questionnaire including the Work Ability Index to assess work ability. Multiple logistic regression analysis was performed adjusting for possible confounding variables.

**Results:** In a population with low intent to leave at baseline prospective analyses showed that a poor work ability at baseline increased the risk of high intent to leave the ward and high intent to leave the organization, 1 year later. A substantial deterioration in work ability was a risk factor for developing high turnover intentions 1 year later. Social support had no effect on the relation between work ability and all three types of intent to leave but the relation between work ability and intent to leave the ward was borderline significantly moderated by good interpersonal relations.

**Conclusions:** Poor work ability was a risk factor for developing turnover intentions. Maintaining good work ability and improving poor work ability becomes increasingly important to retain nurses.



### 3.1. Introduction

Turnover of nursing staff is a major challenge for healthcare settings and for healthcare in general. Nurse turnover can be viewed as contributing to the positive growth of an organization through renewal of personnel, the infusion of new ideas and the introduction of new practices (Hayes et al., 2006). Nevertheless, turnover can be dysfunctional when it occurs at high rate, since it is one of the most important causes of declining productivity and decreasing staff morale (Chen, Chu, Wang, & Lin, 2008).

In a tight labour market as the nursing profession, healthcare organizations do not want to see their staff members leave and are often prepared to dedicate important resources to attract and retain qualified nurses (Glebbeek & Bax, 2004). Therefore, understanding why healthcare workers leave is essential to retain them and to prevent turnover behaviour.

Despite the considerable amount of research on nurse turnover and turnover in general, no univocal definition of turnover exists. It is possible to differentiate between internal and external turnover. Internal turnover of healthcare workers can imply changing one unit for another in the same organization, whereas external turnover means moving to a new employer either to continue working in or outside the nursing profession. Within-organizational turnover can be considered as a stage preceding organizational and even professional turnover if external alternatives become more attractive than the internal ones (Krausz, Koslowsky, Shalom, & Elyakim, 1995). However, a distinction between these three progressive types of turnover behaviour has rarely been made in previous research. Previous studies on nurses' turnover mainly focused on organizational turnover and less on occupational turnover (Simon, Muller, & Hasselhorn, 2010). Research on internal turnover of healthcare workers is almost completely lacking. More empirical research on these different forms of withdrawal behaviour is necessary given their different consequences for healthcare organizations and healthcare in general. Whereas, internal and organizational turnover are, in particular, the concern of the management of an individual healthcare organization, occupational turnover additionally has a societal impact, resulting in a reduction of the total number of active nurses on the job market (Krausz et al., 1995).

One of the strongest and most important predictors of actual turnover behaviour besides job dissatisfaction was found to be turnover intentions (Hayes et al., 2006). Intent to leave is one of the stages in a complex decision-making process that can lead to turnover behaviour (Mobley, Griffeth, Hand, & Meglino, 1979). For the purpose of this study, three different progressive levels of intended turnover behaviour were distinguished, (i) intent to leave the current ward for another in the same organization; (ii) intent to leave the current organization; and (iii)

## **Perceived work ability and turnover intentions: a prospective study among Belgian healthcare workers**

intent to leave the nursing profession to start a different kind of job. Identifying predictors of these different forms of turnover intentions can lead to a better understanding of the process leading to actual turnover and to the development of adequate measures to retain healthcare workers.

### **3.2. Background**

Nurse turnover intentions are influenced by several individual, organizational and economic factors, such as a high education level, job dissatisfaction and low organizational and professional commitment (Coomber & Barriball, 2007; Hayes et al., 2006; Parry, 2008). However, different forms of turnover intentions may be influenced by dissimilar factors. Simon et al. (2010) found in their study on turnover intentions among German nurses that the organizational and professional turnover intentions were associated with different variables with diverse strengths of associations. In line with the existing literature on turnover intentions, these authors found that job satisfaction and professional commitment were associated with both outcomes, but also health-related factors like burnout showed to be associated with both turnover intentions (Simon et al., 2010). Having an adequate health status is a prerequisite to perform the job tasks properly, meaning that the work demands experienced by employees need to sufficiently attune to their physical and mental capacities (van den Berg, Elders, de Zwart, & Burdorf, 2009). However, when this is not the case, health problems may occur which, in turn, may lead to a deliberation of the work situation and can therefore contribute to turnover intentions (Simon et al., 2010). Recently, the concept of work ability has received growing attention in this matter (Camerino et al., 2006; Camerino et al., 2008). The concept is based on the assumption that employees' work ability is determined by their perception of the work demands and their ability to cope with these demands. These demands depend on work characteristics, such as physical and psychosocial requirements of work and work organization. Perceived ability to cope with the demands relies on functional capacities (mental, physical and social resources) and the individual's health, education and competences, attitudes and values (Ilmarinen & Tuomi, 2004). Work ability can be measured by the Work Ability Index (WAI), developed by the Finnish Institute of Occupational Health (FIOH) as an instrument aimed at evaluating how well workers are performing in their current job and how their performance is expected to be with taking into account the specific psychosocial and physical work-related factors, mental and physical capabilities and health (Ilmarinen, Tuomi, & Klockars, 1997; Tuomi et al., 1991).

The WAI has proved to be a predictive measure of early retirement (Feldt, Hyvonen, Makikangas, Kinnunen, & Kokko, 2009; Ilmarinen & Tuomi, 2004; Sell, 2009) and other related outcomes such as long-term sickness absence (Sell, 2009), disability unemployment (Alavinia, De

Boer, van Duivenbooden, Frings-Dresen, & Burdorf, 2009; Liira et al., 2000), mortality (Tuomi et al., 1997) and also change of employer and/or profession (Camerino et al., 2008). The majority of these previous prospective studies are commonly based on a single assessment of work ability.

However, it is also important to investigate the evolution in work ability, since work ability is a dynamic process that varies throughout an individual's working life (Ilmarinen, 2009; Ilmarinen, 2001). Until now, only a few longitudinal studies have been examining work ability and its change over time (Feldt et al., 2009; Ilmarinen et al., 1997; Liira et al., 2000; Marqueze, Voltz, Borges, & Moreno, 2008; Pohjonen & Ranta, 2001; Tuomi et al., 1997). Changes in work ability have mainly been investigated at group level as changes in the mean WAI score (Ilmarinen et al., 1997; Liira et al., 2000; Marqueze et al., 2008; Pohjonen & Ranta, 2001). By analyzing the mean scores in predefined groups, no information is gained about any atypical evolution in work ability (e.g. improvement in WAI over time) on an individual level (Feldt et al., 2009). Change in WAI on an individual level has only been investigated in relation to early retirement but has never been studied in relation to turnover intentions. However, beside examining the effect of poor WAI measured at baseline on employees' turnover intentions 1 year later, it is particularly interesting to find out how change in WAI during a 1-year follow-up period is related to different forms of turnover intentions. Healthcare workers' work ability can evolve over time resulting in: either an improvement in WAI; deterioration in WAI; or a status quo of their WAI. These different types of change may have a different impact on healthcare workers' turnover intentions and may differ according to the type of turnover intention.

Therefore, the aim of the present study was to explore the effect of WAI and its change over time on three progressive types of turnover intentions respectively: (i) intent to leave the current ward for another in the same organization (ITL ward); (ii) intent to leave the current organization (ITL organization); and (iii) intent to leave the nursing profession to start a different kind of job (ITL profession). In addition, since a positive working climate was found to be negatively associated with nurses' turnover intention (van der Heijden et al., 2010), we wanted to investigate if the social work environment, wherein social support and interpersonal relations are core elements, had a protective effect on the relation between WAI and ITL.

### **3.3. The study**

#### **3.3.1. Aims**

The aims of this study were threefold. The first aim was to examine the relation between a single measurement of work ability and the risk of developing turnover intentions 1 year later. We hypothesized that re-

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spondents experiencing a poor WAI at baseline had an increased risk for developing a high ITL ward, high ITL organization and/or a high ITL profession (Hypothesis 1).

A second aim was to study change in WAI over 1 year. In line with previous research (Feldt et al., 2009), we hypothesized that respondents experiencing a substantial deterioration in WAI had a higher risk for developing high ITL ward, high ITL organization and/or high ITL profession in comparison with nurses whose WAI remained good or stable (Hypothesis 2).

Finally, an additional aim of this study was to assess if social support and interpersonal relations at work buffered the effect of WAI on intent to leave. We hypothesized that high social support and good interpersonal relations moderated the relation between WAI and intent to leave (Hypothesis 3).

### **3.3.2. Design**

A prospective questionnaire-based design was used for data collection. The analyzed data of this longitudinal study were collected during 2003–2004.

### **3.3.3. Sample**

The associations between work ability and turnover intentions were assessed in the Belgian sample from the Nurses' Early Exit Study (NEXT) (Hasselhorn et al., 2003). Belgian participating institutions at baseline were selected using a stratified sampling procedure to reflect the national distribution of nursing staff by type of institution, geographical spread and ownership.

A self-administered questionnaire assessing socio-demographic characteristics, work contents, organizational and psychosocial factors, physical and psychological health and well-being, was distributed at baseline and with a time lag of 1 year among all nursing staff (i.e. nursing aids, Registered Nurses and specialized Registered Nurses) employed in thirty seven healthcare organizations.

### **3.3.4. Measures**

#### **Work ability index**

Perceived work ability was measured by means of the WAI comprising seven dimensions (Tuomi et al., 1998): (i) subjective estimation of current work ability compared with optimal life time performance; (ii) subjective work ability in relation to physical and mental demand of work; (iii) number of current diseases diagnosed by a physician; (iv) subjective estimation of working impairment due to ill health; (v) sickness absenteeism during the past year; (vi) personal prognosis of work ability in next 2 years; (vii) mental resources referring to the workers' life in general, both at work and during leisure time. The total score is calculated

ed by summing up all scores (Tuomi et al., 1998) and ranges from 7 to 49 points, with higher scores indicating higher perceived work ability. Based on this WAI score, the individual's work ability can be classified into four different categories: poor (values 7–27), moderate (values 28–36), good (values 37–43), and excellent (values 44–49). In the present study participants who achieved a score below 37 were classified as having a poor WAI, participants having a score of 37 points or higher were considered to have a good WAI.

The internal validity of the WAI has been established, showing a satisfactory relationship between the subjective results of the WAI and the results of more objective measurements (i.e. medical examinations) (Eskelinen, Kohvakka, Merisalo, Hurri, & Wagar, 1991; Nygard, Huuhtanen, Tuomi, & Martikainen, 1997). Furthermore, satisfactory test-retest reliability of the WAI (de Zwart, Frings-Dresen, & van Duivenbooden, 2002) and other good psychometric properties (i.e. internal reliability, factor and construct validity) of the WAI have been demonstrated (Radkiewicz & Widerszal-Bazyl, 2005). The Cronbach's alpha score for the WAI was 0.68.

### Social support

The degree of social support nurses received from their supervisor and their colleagues was assessed by two 4-item scales (van der Heijden, 2002, 2003). These items addressed supervisor and colleagues' ability to appreciate the respondents' work and to give feedback and the degree of supportive advice and help in work performance. Both measures of social support were dichotomized by means of a median split. The Cronbach's alpha score for the social support from supervisor scale was 0.80 and for the social support from colleagues scale 0.72.

### Interpersonal relations

The quality of interpersonal relations between nurses and nursing management, head nurse, colleagues, physicians and administration was assessed by five items, using a five-point scale ranging from hostile and tense to friendly and relaxed (Hasselhorn et al., 2003). The mean score of all five items was calculated to create a single interpersonal relations score. Consistent with social support, this score was dichotomized by means of a median split. Cronbach's alpha score for the interpersonal relations scale was 0.69.

### Outcome measures

All three outcome measures were measured by one question in the NEXT-study (Hasselhorn et al., 2003): 'How often have you respectively thought during the course of the past year about' (i) changing wards in the same organization (ITL ward); (ii) leaving the current institution (ITL organization); and (iii) giving up nursing and starting a different kind of job (ITL profession). Each item had five answer categories, ranging from

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never to every day. Thinking several times a month or more often about leaving was considered as a high intent to leave.

### **3.3.5. Ethical considerations**

The institutional review board of the coordinating university approved the design of the European NEXT-study. All participants received a letter explaining the purposes and procedures of the study. Consent to participate was assumed by return of the questionnaire. To ensure anonymity, respondents generated a unique code identifier to enable their responses to be matched across time.

### **3.4. Data analysis**

To assess the impact of work ability on all three outcome variables, participants reporting high intent to leave at baseline for the specific intent to leave outcome, were excluded from further subsequent analyses. For IITL ward, IITL organization and IITL profession, respectively, 1419, 1368 and 1327 healthcare workers were included. The relation between WAI and all three intent to leave indicators, measured 1 year later, was examined by two multiple logistic regression models. For the first regression model, the WAI score measured at baseline was entered in the model, using participants with a good WAI as reference category (Model 1).

For the second model, as recommended by Twisk (2003, p. 168), the % change in WAI ( $\Delta$ WAI) was computed by taking into account possible ‘ceilings’ (i.e. maximum possible value) and ‘floors’ (minimal possible values) of WAI. Based on this % change, three groups were defined. Those with a  $\Delta$ WAI score in an interval between -1 and +1 standard deviation of the mean  $\Delta$ WAI in the study population were defined as respondents whose WAI score did not change substantially between both measurements. When the  $\Delta$ WAI differed more than 1 standard deviation from the mean, this meant that either the WAI score substantially improved ( $> +1SD$ ) or substantially decreased ( $< -1SD$ ) between both measurements. For this method, respondents whose WAI score remained relatively stable between both measurements were used as the reference category (Model 2). For both models, adjustments were made for age, gender, type of healthcare organization, education level, family situation, and number of working hours and work schedule, entering all variables in a single step.

The buffering effect of social support and interpersonal relations at work on the relation between WAI at baseline and intent to leave 1 year later was investigated through logistic regression analyses. WAI and respectively social support and interpersonal relations, measured at baseline were entered as categorical variables in the model, together with their interaction term (Model 3). Results were considered statistically

significant at the  $P \leq 0.05$  level. Analyses were performed using SPSS 15.0 software (SPSS Inc., Chicago, IL, USA).

### 3.5. Results

#### 3.5.1. Descriptive analysis

At baseline, a total of 4257 questionnaires, with an overall response rate of 61% were returned. One year after the baseline assessment 2857 participants filled in a second questionnaire. Here the response rate was 48%. A total of 1531 participants, who remained working in their organization during the 1-year follow-up, completed both questionnaires and were included in the prospective analysis. The mean age of the participants was 38.4 (SD 8.8) years and ranged from 22–63 years. The majority (92%) of them were women. The nursing staff consisted of 73% Registered Nurses, 20% specialized nurses and 7% nursing aids. Among them, 45% worked in hospitals, 6% in nursing homes and 49% in home care settings. Half of the participants worked between 19–38 hours a week, 41% worked full-time and only a minority worked less than 19 hours a week (8%). The average seniority in the nursing profession was 15.3 years. The majority of the nursing staff members (75%) had a work experience of more than 5 years in their current organization. The mean WAI score of the healthcare workers was 40.3 with a total of 271 healthcare workers (19%), reporting a poor perceived WAI ( $<37$ ). The prevalence of high ITL ward, high ITL organization and high ITL profession at baseline was, respectively, 6%, 10% and 8%. A summary of these characteristics is presented in Table 3.1.

#### 3.5.2. Multivariate analysis

Prospective analysis showed that a poor WAI at baseline (Model 1) was an important predictor of high ITL ward (OR 2.34; 95% CI 1.24–4.41) and high ITL organization (OR 3.25; 95% CI 1.83–5.78) 1 year later (see Table 3.2). A similar trend was observed for ITL profession although no statistically significant results were obtained.

A substantial deterioration in WAI (Model 2) was associated with more elevated risk of developing a high ITL ward 1 year later (OR 2.16; 95% CI 1.04–4.46) (see Table 3.2). In the same way, participants experiencing a substantial deterioration in WAI had more than twice the risk (OR 2.43; 95% CI 1.23–4.77) of having a high ITL organization 1 year later and had an almost three times higher chance (OR 2.93; 95% CI 1.32–6.53) of developing a high ITL profession, in comparison with healthcare workers whose work ability remained relatively stable. A substantial improvement in WAI was associated with a reduced risk of developing high ITL organization (OR 0.56; 95% CI 0.23–1.37) and high ITL profession (OR 0.30; 95% CI 0.07–1.32) compared with the status quo reference group, although these results did not reach statistical significance.

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Table 3.1. Socio-demographic characteristics and study variables at baseline (n=1531)

Variables	n	%	Mean (SD)
<i>Age</i>			38.4 (8.82)
< 45 years	1147	75	
≥ 45 years	384	25	
<i>Seniority in nursing profession</i>			15.3 (8.68)
<i>Seniority in current organization</i>			
≤ 5 years	387	25	
> 5 years	1139	75	
<i>Gender</i>			
Male	115	8	
Female	1416	92	
<i>Type of healthcare setting</i>			
Hospital	684	45	
Nursing Home	92	6	
Home Care	755	49	
<i>Type of healthcare training</i>			
Nursing Aid	108	7	
Registered Nurse	1089	73	
Specialized registered Nurse	294	20	
<i>Family situation</i>			
Alone	139	9	
Only adult with children	75	5	
With another adult	357	24	
With other adult and children	936	62	
<i>Number of working hours a week</i>			
< 19 hours	121	8	
≥ 19 and < 38 hours	757	51	
≥ 38 hours	614	41	
<i>Work schedule</i>			
Day work regular hours	372	25	
Day work others	268	18	
Only night shift	72	5	
Shift work without night	467	31	
Shift work with night	337	22	
<i>WAI</i>			
WAI score			40.3 (4.84)
Poor WAI (WAI < 37)	271	19	
Good WAI (WAI ≥ 37)	1155	81	
<i>High ITL ward</i>	95	6	
<i>High ITL organization</i>	154	10	
<i>High ITL profession</i>	116	8	

WAI, Work Ability Index; ITL, intent to leave

In Model 3, it was investigated if social support at work and interpersonal relations could buffer the effect of WAI measured at baseline



and intent to leave 1 year later. Our results showed that the relations between WAI and respectively ITL organization and ITL profession were not moderated by either social support or interpersonal relations. In addition, social support appeared to have no effect on the relation between WAI and ITL ward (see Table 3.3). However, a trend for a borderline significant interaction effect ( $P = 0.10$ ) was noticeable between WAI and interpersonal relations at work, both measured at baseline in relation to ITL ward (see Figure 3.1). Employees experiencing a poor WAI in combination with poor interpersonal relations at work had an almost three times higher risk (OR 2.82; 95% CI 1.36–5.82) of developing high ITL ward in comparison with their co-workers who had a good WAI. On the other hand, no impact of poor WAI on ITL ward was found when interpersonal relations at work were good (OR 0.86; 95% CI 0.25–2.95).

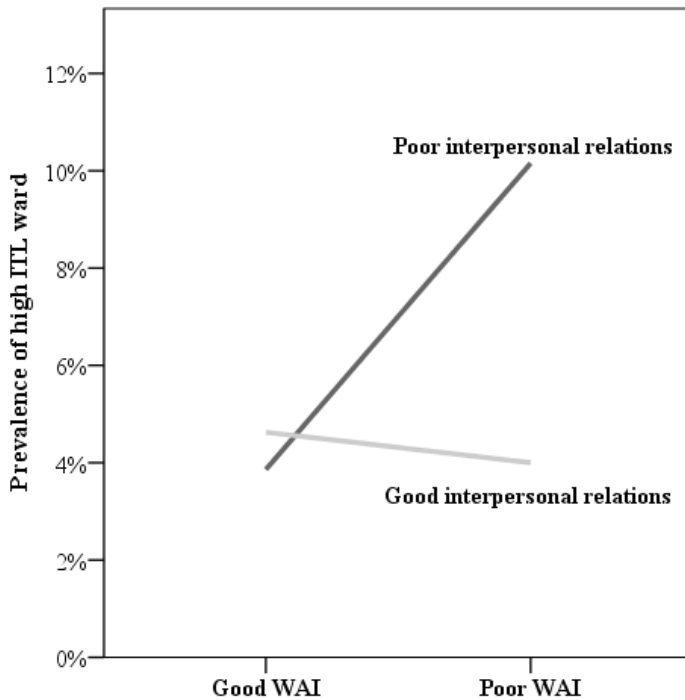


Figure 3.1. The impact of work ability index (WAI) and interpersonal relations at work on intent to leave the ward (ITL ward)

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Table 3.2. Multivariate associations between baseline and change ( $\Delta$ ) in work ability index (WAI) and intent to leave (ITL), 1 year later.

	Intent to leave the ward			Intent to leave the organization			Intent to leave the profession		
WAI	n (%)	OR (95% CI)	p	n (%)	OR (95% CI)	p	n (%)	OR (95% CI)	p
Model 1: Baseline WAI									
good WAI	1088 (82)	1		1050 (83)	1		1026 (83)	1	
poor WAI	236 (18)	2.34 (1.24-4.41)	.009	223 (17)	3.25 (1.83-5.78)	<.001	216 (17)	1.93 (0.88-4.23)	.099
Model 2: $\Delta$ WAI									
mean $\pm$ 1 SD	907 (71)	1		896 (71)	1		853 (71)	1	
> + 1 SD	233 (18)	1.23 (0.59-2.57)	.576	224 (18)	0.56 (0.23-1.37)	.205	215 (18)	0.30 (0.07-1.32)	.112
< - 1 SD	135 (11)	2.16 (1.04-4.46)	.038	128 (11)	2.43 (1.23-4.77)	.010	128 (11)	2.93 (1.32-6.53)	.009

For ITL ward, ITL organization and ITL profession, respectively, 1419, 1368 and 1327 healthcare workers were included in the analyses after excluding the respondents who had a high ITL at baseline.

Model 1 and 2: adjusted for age, gender, education level, family situation, shift work, number of working hours and type of healthcare organization.

*Table 3.3. Model 3: Effect of interpersonal relations at baseline on the relations between the work ability (WAI) at baseline and intent to leave (ITL), 1 year later.*

Model 3	Intent to leave the ward		Intent to leave the organization		Intent to leave the profession	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
WAI	2.82 (1.36-5.82)	.005	2.48 (1.25-4.93)	.010	2.98 (1.11-7.99)	.030
Interpersonal relations	1.21 (0.65-2.26)	.555	0.72 (0.38-1.36)	.311	1.94 (0.88-4.27)	.102
WAI*Interpersonal relations	0.31 (0.07-1.28)	.105	1.44 (0.48-4.33)	.513	0.41 (0.08-2.01)	.270

### 3.6. Discussion

In the present study, we investigated prospective relations between work ability and three progressing types of intent to leave, respectively, ITL ward, ITL organization and ITL profession, among 1531 Belgian healthcare workers. Our method of analysis differed from that of previous work ability research since both single (Model 1) and multiple measurements of work ability (Model 2) were examined in relation to these different types of intent to leave. In addition, the protective effect of social support and interpersonal relations at work in this relation was explored.

The first hypothesis stating that a poor WAI is a predictor of intent to leave was confirmed in our study. A poor WAI at baseline elevated the risk of developing high ITL ward, high ITL organization and partly high ITL profession. These findings were in line with the results obtained by Camerino et al. (2008), who found that poor perceived work ability at baseline was associated with a higher intent to leave the current job both inside and outside the organization and with a stronger intent to leave the nursing profession among younger Italian nurses up to the age of 45 years.

In contrast to the study by Camerino et al. (2008), we also investigated change in WAI. A substantial deterioration in WAI was found to be an important predictor of all three intent to leave indicators, in line with our second hypothesis. Although the results did not reach statistical significance, healthcare workers who reported a substantial improvement in WAI appeared to have a lower risk of having a high ITL organization and a high ITL profession 1 year later, compared with co-workers whose WAI remained relatively stable during the follow-up period.

It appears that a single time-point measurement of WAI is an effective and easier way to predict healthcare workers' future ITL ward and ITL organization than measuring change in WAI but it does not allow to predict the risk of high ITL profession 1 year later. This latter prediction requires repeated measurement of WAI. The added value of measuring change in WAI is that this allows on the one hand predicting healthcare workers' future risk of developing high ITL profession, which may be particularly the concern of healthcare in general given the attempts to stimulate sustained participation in the nurses' labour market. On the other hand, because work ability may change over time, repeated measurements of WAI also enable the management of healthcare organizations to identify and subsequently further monitor nursing staff members who are at risk of developing high internal and organizational turnover intentions during their career.

Furthermore, no impact of poor WAI on ITL ward was found when the interpersonal relations in the ward were good, which partly confirmed our last hypothesis. It is remarkable that, although healthcare workers perceived their work ability to be low, good interpersonal rela-

tions seemed to prevent them from considering leaving the current ward. This could be attributed to the fact that a positive work climate, positively influences employees' professional growth and career development (van der Heijden, 2002, 2003), which might prevent them from developing high ITL ward because they find enough challenges in their current ward. In contrast to this less severe type of turnover intention, good interpersonal relations could not buffer the adverse effect of poor WAI on the more progressive forms of intent to leave such as organizational and professional turnover intentions. A good understanding between nurses and nursing management, head nurse, colleagues, physicians and administration seems to be especially important in the context of a ward but might be less relevant to influence nurses' willingness to remain in their current organization or profession. Simon et al. (2010) found in the German sample of the NEXT- study, that the intention to leave the organization was strongly associated with organizational leadership and the local context, whereas intent to leave the profession was strongly related with personal factors and work-home conflict. This might explain why we also did not find a moderating effect of social support by superior and co-workers on the relations between poor WAI and respectively ITL organization and ITL profession. However, unlike good interpersonal relations, no interaction effect was found between social support and WAI for ITL ward. It might be that nurses' judgment of the quality of their interpersonal relations at work reflects not only an emotional or relational evaluation but rather an instrumental or functional appraisal of their work relations. One can also argue that not all interpersonal relations at work are social supportive.

Although only one interaction effect between interpersonal relations and WAI was found for ITL ward in our study, the importance of the social work environment in the prevention of turnover intentions should not be neglected. As suggested by Estryn-Behar, van der Heijden, Fry, & Hasselhorn (2010), in their study on nurses' turnover, the management of healthcare organizations should stimulate a positive working climate at team and organizational level to retain nurses. Attention should, therefore, be given to the interpersonal aspects of nurses' work context to deal with conflicts and to relationship problems to promote a supportive social work environment. In addition, the amount of perceived social support from the supervisor seems to be positively associated with the amount of perceived social support from close colleagues and both forms of social support appeared to be negatively associated with nurses' ITL profession beyond the effect of job satisfaction and age (van der Heijden et al., 2010).

Considering our results, preventive measures promoting and maintaining good work ability are needed at several preventive levels and in different time periods to prevent high turnover intentions. WAI is found to be influenced by several factors like individual characteristics, lifestyle, work demands and physical and mental capacities (van den Berg et al., 2009). However, it was suggested that preventive measures should ad-

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dress in particular psychosocial work conditions rather than focusing on individual and lifestyle factors (Feldt et al., 2009; Ilmarinen, 2009; van den Berg et al., 2008).

Since ITL ward may be considered as a predictor of external turnover intentions (Krausz et al., 1995; Morrell, 2005) and given our results suggesting that the risk of developing high ITL ward due to poor WAI was buffered by good interpersonal relations at work, an additional way to reduce nurses' turnover intentions, besides influencing work ability, might be improving the social work environment by stimulating good interpersonal relations. Interpersonal relationships at work may be improved by better interpersonal communication with physicians, co-workers, the head nurse, the nursing management and the administration. Timely and adequate communication contribute to team effectiveness and quality of care, which in turn has shown to affect job satisfaction and subsequently turnover (Stordeur & D'Hoore, 2007).

### **Limitations**

The limitations of the present study need to be acknowledged. A notable limitation is that sample attrition may have affected our results. From the initial 4257 participants, only 1531 of them were involved in both measurements. A comparison between respondents and non-respondents suggested a healthy worker effect. Those who did not return the second questionnaire, were those who suffered from more adverse working conditions at baseline (i.e. lower WAI). Consequently, our findings may be underestimated due to this sample bias.

Another possible weakness is the use of self-reported measures for both the predictor and dependent variables, through which a common-method bias might have played a role. Nevertheless, Spector (2006) stated that these influences are not as high as could be expected. In addition, it has been suggested that the use of self-reported measures for both exposure and outcome variables is less problematic when there is a prospective design (Tennant, 2001, Theorell & Hasselhorn, 2005). Finally, also the fact that change in WAI was measured over a relative short time period (1 year) might be a possible limitation, nevertheless an adverse evolution in work ability during the 1-year follow-up was found to be significantly predictive for all three forms of intent to leave.

### **3.7. Conclusion**

The results of this study indicate, mainly in line with our hypotheses, that on the one hand a poor baseline WAI is a predictor of internal and organizational turnover intentions and, on the other hand, a deterioration in WAI is predictive for all three progressive forms of turnover intentions among nurses and nursing aids. Our study extends the existing work ability literature with additional support for the relation between change in WAI and intent to leave. These findings have implications for healthcare organizations and healthcare in general. Management of

healthcare organizations and policymakers should pay more attention to the importance of a good work ability of healthcare workers to counter the development of high internal, organizational and occupational turnover intentions, which could be considered as antecedents of actual turnover. At the organizational level, healthcare organizations need to be encouraged to develop strategies enabling them to take measures to sustain and/or to improve the work ability of their nursing staff. One possible way may be influencing employees' competences, values, attitudes and motivation given that work ability is not only determined by health and functional capacity. At the ward level, stimulating good interpersonal relations at work in case of poor work ability could be an additional way to reduce the intention to leave the current ward in the same organization. At the occupational level, it is necessary to follow-up change in WAI over time to be able to take preventive measures for those healthcare workers who are at risk of developing occupational turnover intentions. This is especially important given that a high ITL profession has the severest impact on the nursing profession and on healthcare in general.

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## **Chapter 4.      IMPACT OF THE EFFORT- REWARD IMBALANCE MODEL ON INTENT TO LEAVE AMONG BELGIAN HEALTHCARE WORK- ERS: A PROSPECTIVE STUDY**

Derycke, H., Vlerick, P., Burnay, N., Declaire, C., D'Hooe, W., Hasselhorn, H. M., & Braeckman, L. (2010). Impact of the effort-reward imbalance model on intent to leave among Belgian health care workers: A prospective study. *Journal of Occupational and Organizational Psychology*, 83(4), 879-893.

## **Impact of the Effort-Reward Imbalance model on Intent to leave among Belgian healthcare workers: a prospective study**

### ***Abstract***

The aim of this study was to analyze the impact of the effort-reward imbalance (ERI) model on intent to leave the current organization (ITL organization) and intent to leave the nursing profession (ITL profession) in a prospective way. A total of 1,531 healthcare workers who remained in their job filled in a self-administered questionnaire at baseline and one year later. ERI was measured at baseline by a 23-item questionnaire. Multivariate logistic regression analyses were performed. Within a population with low intent to leave at baseline, we found that an imbalance between high efforts and low rewards (extrinsic hypothesis) increased the risk of high ITL organization (OR 4.98; 95% CI 2.07-11.97) and high ITL profession (OR 1.84; 95% CI 1.03-3.30), 1 year later. A high level of overcommitment (OC; intrinsic hypothesis) was not predictive for both intent to leave outcome variables, neither was the interaction between high efforts/low rewards and a high level of overcommitment (interaction hypothesis). Our results showed that a perceived effort-reward imbalance at work is a significant predictor of intent to leave among healthcare workers. This contribution concludes with some directions aimed at boosting nurses' retention and recommendations for future research.

## 4.1. Introduction

In the last decades, the demand for nurses has continued to increase due to a growing ageing population, an increased consumer behaviour in combination with higher patient expectations, and the rapid evolution of medical technologies (Coomber & Barriball, 2007; Simoens, Villeneuve, and Hurst, 2005). At the same time, fewer young people are entering the nursing profession which may be the result of the low social value given to nursing and the negative perceptions of nurse working conditions (Kivimaki, Vahtera, Elovainio, Virtanen, & Siegrist, 2007; Simoens et al., 2005; Stordeur et al., 2003). Moreover, healthcare settings are facing high turnover of nursing staff and problems in recruiting new employees (Kivimaki et al., 2007; Stordeur et al., 2003; Stordeur & D'Hoore, 2007). Organizational and professional turnover, like absence from work are, examples of work-related withdrawal behaviour (Krausz, Koslowsky, Shalom, and Elyakim, 1995). High turnover is a major problem for nursing and for healthcare in general. Beside substantial financial costs, turnover causes negative patient and nurse outcomes (e.g. increased waiting times, decreased patient and nurse satisfaction, adverse nurse health) (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Hayes et al., 2006; Kivimaki et al., 2007; O'Brien-Pallas et al., 2006).

Understanding why healthcare workers abandon their current employer and/or their job in the nursing profession is essential, in order to retain them and to prevent turnover behaviour. One of the most important and strongest predictors of actual nurse turnover was found to be intention to leave (Borda & Norman, 1997; Hayes et al., 2006; O'Brien-Pallas et al., 2006; Stordeur et al., 2007; Widerszal-Bazyl, Radkiewicz, Hasselhorn, Conway, & van der Heijden, 2008). According to Mobley's (1977) revisited model actual turnover is the last stage of a decision-making process in which several turnover cognitions play a role, such as thinking of quitting, intent to quit and intent to search for a new job (Sager, Griffeth, & Hom, 1998). In healthcare, two turnover cognitions are of great importance: intent to leave the current healthcare organization (ITL organization) and intent to leave the nursing profession (ITL profession). This distinction between organizational and professional turnover intentions is been made, since organizational turnover is in particular the concern of the management of an individual healthcare setting, whereas professional turnover additionally has a societal impact, directly leading to a decrease of healthcare workers on the job market (Krausz et al., 1995).

Resigning and moving to another organization or intending to do this can be interpreted as a way to actively or passively cope with an unhealthy work environment. Psychosocial work conditions have received growing attention as potential antecedents of turnover intention and actual turnover (Josephson, Lindberg, Voss, Alfredsson, & Vingard, 2008). Within this context several theoretical stress models have been developed to study the relation between job characteristics ('stressors')

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and stress reactions ('strains') (de Jonge, Le Blanc, & Schaufeli, 2007). Two prominent work stress models are the job demand-control-support model and the effort-reward-imbalance (ERI) model. The job demand-control-support model (JDCS) introduced by Karasek (1979), and Karasek & Theorell (1990) postulates that the combination of high job demands, low decision latitude and low social support at work leads to reduced employee well-being and stress-related health complaints.

A second more recent stress model is the effort-reward imbalance model (ERI model) of Siegrist (1996). This model has its roots in medical sociology and emphasizes both the efforts and rewards at work (Marmot, Siegrist, Theorell, & Feeny, 1999). It has been suggested by Marmot et al. (1999) that the ERI model might have more power for explaining stress in the service occupations and professions, in particular those dealing with person-based interaction, such as health professionals. Another advantage of this model is the inclusion of both situational (extrinsic) and personal (intrinsic) characteristics (i.e. overcommitment, OC).

The main assumption of the ERI model is that a failed reciprocity between high efforts spent at work and low occupational rewards received (ERI) may cause a state of emotional distress, which in turn can result in a sustained stress reaction and adverse effects on health and employee well-being (cf. labelled as the extrinsic hypothesis).

It is assumed that people will not passively remain in a high effort-low reward situation, but instead will try cognitively and behaviourally to reduce their efforts and/or maximize their rewards (van Vegchel, de Jonge, Bosma, & Schaufeli, 2005). This could be seen as a homeostatic regulation process (Vancouver, 2000). Functional homeostatic regulations at work involve self-regulation processes in order to cope with states of psychological imbalance at work induced by stressors at work (Pomaki & Maes, 2002). Developing turnover intentions might be viewed as one way of coping with an ERI. In addition, recurrent reward frustration was found to reduce commitment and motivation of employees and to increase withdrawal behaviour (Godin & Kittel, 2004).

Beside extrinsic work characteristics, a personal component is included in the model: overcommitment (OC). This intrinsic characteristic defines a set of attitudes, behaviours, and emotions reflecting excessive striving in combination with a strong desire to be approved and esteemed. Overcommitted employees exaggerate their efforts beyond levels usually considered appropriate (Siegrist et al., 2004; van Vegchel et al., 2005). As a result, their susceptibility to reward frustration is increased (Siegrist et al., 2004). Employees experiencing a high level of OC, possibly resulting in continued exaggerated efforts combined with disappointing rewards, are expected to have an increased risk of developing negative emotions which can cause possible adverse effects on health and employee well-being, even in the absence of an extrinsic ERI (Siegrist et al., 2004; cf. labelled as the intrinsic hypothesis).

OC influences the perception of both effort and reward. Therefore overcommitted people are assumed to respond with more strain reactions to an ERI, in comparison with their less overcommitted colleagues (Siegrist et al., 2004; Tsutsumi & Kawakami, 2004; cf. labelled as the interaction hypothesis).

In numerous studies, the ERI model has been applied to a wide range of health outcomes in particular to cardiovascular disease outcomes (Kuper, Singh-Manoux, Siegrist, & Marmot, 2002) but it has been tested to a lesser extent in association with behavioural outcomes (e.g. sickness absence), and job-related well-being outcomes (e.g. work motivation, job satisfaction) (van Vegchel et al., 2005).

To the authors' knowledge, in only two studies (Hasselhorn, Tackenberg, & Peter, 2004; Kinnunen, Feldt, & Makikangas, 2008) the ERI model was applied to the work-related outcome intent to leave. Both study designs (Hasselhorn et al., 2004; Kinnunen et al., 2008) however remained cross-sectional. As van Vegchel et al. (2005) argued, there is still a high need for non-cross-sectional research designs.

Therefore, the aim of the present study is to investigate the ERI model by testing all three hypotheses in a prospective way, using the standardized ERI questionnaire developed by Siegrist et al. (2004) on two outcome variables: intent to leave the nursing profession (ITL profession) and intent to leave the current healthcare organization (ITL organization).

### 4.1.1. Study hypotheses

*Hypothesis 1: (Extrinsic hypothesis): An imbalance between high occupational efforts and low rewards increases the risk of developing a high ITL profession (H1a) and a high ITL organization (H1b) one year later.*

*Hypothesis 2: (Intrinsic hypothesis): A high level of OC increases the risk of developing a high ITL profession (H2a) and a high ITL organization (H2b) one year later.*

*Hypothesis 3: (Interaction hypothesis): Nursing staff reporting an ERI in combination with a high level of OC have an even higher risk of developing a high ITL profession (H3a) and a high ITL organization (H3b) one year later.*

## 4.2. Methods

### 4.2.1. Study sample

The WOQUAL (health and safety for work quality) study is a research project further exploring the longitudinal data of the Belgian sample from the Nurses Early Exit (NEXT) Study (Hasselhorn, Tackenberg, & Muller, 2003). Belgian participating institutions at baseline were selected using a stratified sampling procedure to reflect the national distribution of nursing staff by (1) type of institution (hospital, nursing home, and homecare service), (2) geographical spread (the three Belgian regions: Brussels, Flanders and Wallonia) and (3) ownership (private

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versus public institutions). Out of 48 selected healthcare organizations, a total of 37 institutions volunteered in this study.

A prospective questionnaire-based design was used for data collection. Two self-administered questionnaires with a time lag of one year were distributed among all nursing staff (i.e. nursing aides, registered nurses and specialized registered nurses) employed in the 37 healthcare settings.

At baseline, between autumn 2002 and spring 2003 (Time 1), a total of 4,257 questionnaires was returned, with an overall response rate of 61.3%. To examine if the ERI model was predictive for intent to leave one year later, only those nursing staff members who remained working in their job and organization during that year, received the second questionnaire (i.e. non-leavers), regardless of their participation at baseline. One year after the baseline assessment 2,857 participants completed the follow-up questionnaire. Here the response rate was 48.0%. A coding system was used which made it possible to match the two questionnaires of each participant. Finally, a total of 1,531 participants, completed both questionnaires and were included in the prospective analyses.

### **4.2.2. Measures**

#### **Baseline predictors**

##### *ERI model*

To measure the three components of the ERI model, a standardised questionnaire, developed by Siegrist et al. (2004) containing 23 Likert scaled items was used.

##### *Effort*

Effort was assessed by six items, measuring demanding aspects of the work environment, e.g. work pressure, time pressure, responsibility, working overtime, increasing demands and physical load. Items were answered in two steps. In the first step participants had to indicate if an item content described a typical experience of their job. The answer categories were “yes” and “no”. If they agreed, participants had to evaluate in the second step on a four-point rating scale to what extent they usually felt distressed by this typical experience. The overall effort score was ranging from 6 to 30. The higher the score, the higher the level of distress. The Cronbach’s alpha for the effort was 0.72.

##### *Reward*

Reward was measured by eleven items, covering different rewards: financial reward (1 item: salary), esteem reward (5 items; i.e. respect and support) and career opportunities (4 items, i.e. promotion opportunities) and job security (1 item). The rating and scoring procedure was the same as for the effort scale. The overall reward score varied between 11 and



55. The higher the score, the more rewards the job offers. Cronbach's alpha for the reward scale was 0.80.

Several formulations to operationalize the co-occurrence of efforts and rewards, such as the discrepancy (i.e. relative excess), the interactive (i.e. multiplicative interaction) and the proportional form (i.e. ratio term) are discussed by van Vegchel, de Jonge, and Landsbergis (2005). We applied the main recommended formulation of ERI, namely the ratio term (Siegrist & Peter, 1996)<sup>1</sup>. The ratio was computed by placing the effort score in the numerator, and the reward score in the denominator. The reward score had to be multiplied by a correction factor (0.5454) because of an unequal number of items in the numerator and denominator (6/11). A value close to zero indicates a favourable condition (relatively low effort, relatively high reward), whereas values beyond 1.0 indicate a critical condition of high costs (efforts) and low gain (rewards). The ratio can be either used as a continuous variable or can be transformed into a binary variable (values  $\leq 1$  vs.  $> 1$ ). In our study sample, the prevalence of a ratio above 1 at baseline was 4.4%. Due to this low prevalence, our formulation of ERI may diminish statistical power. As suggested by Niedhammer, Tek, Starke, and Siegrist (2004), based on the continuous variable, quartiles were defined in order to obtain dose-response associations between ERI and the outcome variables. Consistent with other researchers (Godin, Kittel, Coppieters, and Siegrist, 2005; Kuper et al., 2002) we used the upper quartile of the distribution of the ERI ratio in order to define the people at risk.

### *Overcommitment*

The last component of the ERI model comprised six items. OC is a personal characteristic and refers to the inability to withdraw from work obligations and the strong need for esteem and approval. Each item consisted of four answer categories: (1) strongly disagree; (2) disagree; (3) agree and (4) strongly agree. The total score was varying between 6 and 24. The higher the score, the more likely a subject is to experience OC. In line with ERI, people exposed to high levels of overcommitment were defined by using the upper quartile of the distribution among the total study population. Cronbach's alpha for the overcommitment scale was 0.78.

### *Outcome measures*

#### *Intent to leave the profession*

Similar to Widerszal-Bazyl et al. (2008), ITL profession was measured by three items based on one general question: "How often do you think about " (1) further qualification outside nursing; (2) giving up nurs-

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<sup>1</sup> Data analyses based on the multiplicative interaction and the relative excess operationalization of effort and reward showed weaker and less interpretable results in comparison with the ratio term for both dependent variables in our study.

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ing; (3) giving up nursing and starting a different kind of job. Each item had five answer categories, ranging from 'never' to 'every day'. The ITL profession variable was dichotomised. Participants indicating thinking about the content of at least one item several times a month or more, were considered having a high ITL profession. In contrast, considering leaving a couple of times a year could be seen as natural for most professionals (Hasselhorn et al., 2003). Cronbach's alpha for the three-item scale was 0.74.

### ***Intent to leave the organization***

ITL organization was measured by one single question: "How often do you think about leaving the current institution." Five answer categories ranging from 'never' to 'every day' were used. A similar item was also used by Kinnunen et al. (2008). Thinking sometimes a month or more often about leaving the current institution was considered as a high ITL organization.

### **Confounders**

Several baseline variables were included as potential confounding variables of the relationship between the ERI model and both intent to leave indicators at Time 2. Based on the existing literature about intent to leave and data from the NEXT-study (Boumans, de Jong, & Vanderlinden, 2008; Hasselhorn et al., 2003; Widerszal-Bazyl et al., 2008), following confounders were included for analyses: age (continuous), gender, type of healthcare organization, education level and family situation. Two extra variables were added: number of working hours (Flinkman, Laine, Leino-Kilpi, Hasselhorn, & Salantera, 2008; Kinnunen et al., 2008; van Vegchel, de Jonge, Meijer, & Hamers, 2001) and work schedule (Flinkman et al., 2008; Hayes et al., 2006; Siegrist, 1996), given that a high number of the nursing staff members worked part-time (Stordeur et al., 2003) and because working an inflexible shift schedule brings unique stresses and demands (Flinkman et al., 2008; Willis, O'Connor, & Smith, 2008). No a priori hypotheses were formulated regarding these confounders.

### **4.2.3. Statistical analysis**

To assess, in a longitudinal design, the impact of the ERI model measured at baseline, on both outcome variables, participants reporting either a high ITL organization or a high ITL profession at baseline, were excluded from further analysis consistent with Hasselhorn et al. (2008).

In order to explore whether ERI, OC and possible confounding variables, all measured at baseline, were associated with the two outcome variables at Time 2, chi-squared tests were performed.

Multivariate logistic regression was used to test all three hypotheses of the ERI model on both intent to leave outcomes. To examine the extrinsic and the intrinsic hypotheses, the two components (ERI ratio

and OC measured at baseline) were introduced separately to assess their relative contribution to the estimation of both intent to leave indicators. For the interaction hypotheses, the two components together with the interaction term  $ERI \times OC$  were entered in the model. In all prospective analyses, adjustments were made for all mentioned confounding variables, regardless of the result of their univariate associations with both outcomes. The underlying reason for this was to prevent that potentially important variables were rejected. All variables were entered in a single step. Analyses were performed using SPSS 15.0 software.

### **4.3. Results**

#### **4.3.1. Descriptive analysis**

A total of 1,531 healthcare workers participated in this prospective study, who were employed in different kinds of settings: 684 (44.7%) in hospitals, 92 (6.0%) in nursing homes and 755 (49.3%) in home care settings. The majority (92.5%) of them were women ( $N=1,416$ ) against only 115 men (7.5%). The mean age of the participants was 38.4 years and ranged from 22 to 63 years. The job seniority ranged from 1 to 37 years with an average of 15.3 years. Almost three fourth (74.6%) of the healthcare workers were more than 5 years employed in their organization. Registered nurses (73.1%) represented the majority of nursing staff members, followed by specialized registered nurses (19.7%) and nursing aids (7.2%). Half of the nursing staff study population was working between 19 and 38 hours a week, 41.2 % worked full-time and only a minority worked less than 19 hours a week (8.1%). A summary of these characteristics is presented in Table 4.1.

#### **4.3.2. Univariate analysis**

At baseline the prevalence of high ITL profession and high ITL organization was respectively, 20.5% and 10.1% (Table 4.1) and at Time 2, 17.8% for high ITL profession and 8.7% for high ITL organization. Table 4.2 gives an overview of the univariate associations. Prospective analyses were conducted on a study population of 1187 participants for ITL profession and on a study sample of 1368 participants for ITL organization. Of the two ERI model components (ERI and OC), only ERI was significantly associated with both intent to leave outcome variables ( $p<0.001$ ). For OC, only a significant association was found with ITL profession ( $p=0.012$ ).

Of the possible confounding variables, 'type of healthcare institution' was significantly associated with both intent to leave outcomes ( $p<0.001$ ). ITL profession at T2 was highest in hospitals (16.7%), and healthcare workers from nursing homes had the highest ITL organization 1 year later (13.9%). 'Gender' was respectively significantly and borderline significantly associated with ITL profession ( $p=0.002$ ) and ITL organization ( $p=0.051$ ). For both outcome variables men had the highest intent to leave, respectively 21.8 and 10.3%. Furthermore, ITL organiza-

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tion was significantly associated with 'family situation' ( $p=0.010$ ) and 'education level' ( $p=0.033$ ). The highest ITL organization was found among single parents (12.5%) and specialized registered nurses (9.2%). ITL profession was significantly associated with 'number of working hours a week' ( $p<0.001$ ). Nursing staff working full-time had the highest ITL profession one year later (16.1%). Age and work schedule were not significantly associated with both intent to leave indicators.

### **4.3.3. Multivariate analysis**

As indicated before, logistic regression analyses were performed in order to test all three hypotheses of the ERI model on both outcome variables.

ERI was found to be a significant predictor for both intent to leave outcomes, even after adjusting for age, gender, type of healthcare organization, education level, family situation, number of working hours, and work schedule. Results showed that participants experiencing an imbalance between efforts spent and rewards received at baseline (Q4) had a 1.84 times higher risk (OR 1.84; 95% CI 1.03-3.30) of having a high ITL profession 1 year later and a five-fold higher chance (OR 4.98; 95% CI 2.07-11.97) of having high ITL organization 1 year later, compared to healthcare workers in the lowest quartile (Table 4.3). OC was not significantly predictive for both intent to leave indicators, neither was the interaction between ERI and a high level of OC.

Table 4.1. Socio-demographic characteristics and study variables at baseline (n=1,531)

Variables	n	%	Mean (SD)	Range
<i>Age</i>			38.41 (8.82)	22~63
<i>Seniority in nursing profession</i>			15.31 (8.68)	1~37
<i>Seniority in current organization</i>				
≤ 1 year	111	7.3		
1-5 years	276	18.1		
≥ 5 years	1,139	74.6		
<i>Gender</i>				
Male	115	7.5		
Female	1,416	92.5		
<i>Type of healthcare organization</i>				
Hospitals	684	44.7		
Nursing Home	92	6.0		
Home Care	755	49.3		
<i>Type of healthcare training</i>				
Nursing Aid	108	7.2		
Registered Nurse	1,089	73.1		
Specialized Reg. Nurse	294	19.7		
<i>Family situation</i>				
Alone	139	9.2		
Only adult with children	75	5.0		
With another adult	357	23.7		
With other adult and children	936	62.1		
<i>Number of working hours a week</i>				
< 19 hours	121	8.1		
≥ 19 and < 38 hours	757	50.7		
≥ 38 hours	614	41.2		
<i>Work schedule</i>				
Day work regular hours	372	24.5		
Day work others	268	17.7		
Only night shift	72	4.7		
Shift work without night	467	30.8		
Shift work with night	337	22.3		
<i>High ITL profession</i>	307	20.5		
<i>High ITL organization</i>	154	10.2		
<i>ERI* ratio</i>	1,489		0.54	0.20~2.13
ERI ≤ 1	1,424	95.6		
ERI > 1	65	4.4		
<i>Overcommitment</i>	1,512		13.86 (3.17)	6~24

\*ERI = effort-reward imbalance

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Table 4.2. Univariate associations between baseline measures and high intent to leave (ITL) at Time 2 (T2), 1 year later.

Baseline variables	High ITL profession T2			High ITL organization T2		
	n	%	$\chi^2$ (p)	n	%	$\chi^2$ (p)
<i>Age groups (years)</i>			1.80 <sup>a</sup> (.406)			4.54 <sup>a</sup> (.103)
< 30	26	11.3		22	8.6	
≥ 30 and < 45	67	10.3		39	5.4	
≥ 45	39	13.3		15	4.7	
<i>Gender</i>			<b>9.30</b> (.002)			3.81 (.051)
Male	17	21.8		10	10.3	
Female	115	10.5		66	5.5	
<i>Type of healthcare organization</i>			<b>24.29<sup>a</sup></b> ( $<.001$ )			<b>22.42<sup>a</sup></b> ( $<.001$ )
Hospitals	80	16.7		46	8.0	
Nursing Home	5	7.7		10	13.9	
Home Care	47	7.5		20	3.1	
<i>Type of healthcare training</i>			1.69 <sup>a</sup> (.430)			<b>6.83<sup>a</sup></b> (.033)
Nursing Aid	10	14.5		7	7.6	
Registered Nurse	86	10.8		46	5.0	
Specialized Reg. Nurse	26	13.4		23	9.2	
<i>Family situation</i>			4.43 <sup>b</sup> (.219)			<b>11.41<sup>b</sup></b> (.010)
Alone	16	17.4		11	9.2	
Only adult with children	5	10.7		8	12.5	
With another adult	30	14.5		21	7.4	
With other adult and children	73	10.5		36	4.4	
<i>Working hours a week</i>			19.56 <sup>a</sup> ( $<.001$ )			4.71 <sup>a</sup> (.095)
< 19 hours	11	12.4		8	8.6	
≥ 19 and < 38 hours	44	7.4		29	4.4	
≥ 38 hours	74	16.1		35	6.8	
<i>Work schedule</i>			8.52 <sup>c</sup> (.074)			6.84 <sup>c</sup> (.145)
Day work regular	28	9.2		13	4.0	
Day work others	19	8.5		9	3.9	
Only night shift	6	11.8		3	4.9	
Shift work without night	40	11.5		28	7.1	
Shift work with night	38	16.1		22	7.9	

<i>ERI quartiles*</i>				<b>18.06<sup>b</sup></b> ( $<.001$ )		<b>27.31<sup>b</sup></b> ( $<.001$ )	
Q1	24	7.6		8	2.4		
Q2	27	8.9		10	3.1		
Q3	34	11.8		22	6.9		
Q4	43	18.5		31	11.1		
<i>OC quartiles**</i>				<b>10.94<sup>b</sup></b> (.012)		3.52 <sup>b</sup> (.318)	
Q1	29	10.9		17	6		
Q2	22	6.8		13	3.8		
Q3	39	14.4		22	7.1		
Q4	41	13.7		22	6.3		

*Note.* Significant results in bold; Number of degrees of freedom is 1 unless stated otherwise; <sup>a</sup> number of degrees of freedom is 2; <sup>b</sup> number of degrees of freedom is 3; <sup>c</sup> number of degrees of freedom is 4.

\*ERI = effort-reward imbalance; \*\* OC = Overcommitment

*Table 4.3. Multivariate associations between baseline measures and intent to leave (ITL) at Time 2 (T2), 1 year later.*

	ITL profession T2			ITL organization T2		
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
<i>ERI<sup>a</sup></i>						
Q1	1			1		
Q2	0.99	0.55-1.81	ns	1.20	0.45-3.23	ns
Q3	1.17	0.65-2.10	ns	2.85	1.19-6.80	.018
Q4	1.84	1.03-3.30	.041	4.98	2.07-11.97	$<.001$
<i>OC<sup>a</sup></i>						
Q1	1			1		
Q2	0.69	0.38-1.28	ns	0.79	0.36-1.75	ns
Q3	1.59	0.91-2.77	ns	1.52	0.75-3.08	ns
Q4	1.45	0.83-2.52	ns	1.36	0.67-2.77	ns
<i>ERI X OC<sup>a</sup></i>						
ERI ratio X						
OC	0.94	0.74-1.20	ns	0.71	0.49-1.01	ns

ERI: Effort-Reward Imbalance; OC: Overcommitment; ns, not significant

<sup>a</sup> Adjusted for age, gender, type of healthcare organization, family situation, number of working hours and work schedule, education level.

## 4.4. Discussion

### 4.4.1. ERI model

In this paper, the validity of the ERI model for predicting intent to leave was analysed among a Belgian sample of 1,531 mainly female healthcare workers in different settings. Support has been found for the

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extrinsic hypothesis (Hypothesis 1) but no evidence was gathered either for the intrinsic (Hypothesis 2) or for the interaction hypothesis (Hypothesis 3). According to van Vegchel et al. (2005), the extrinsic hypothesis has been the most intensively studied, and for a majority of studies including job-related well-being outcome variables, support has been found for this hypothesis, even after extensive confounder adjustment.

Our results showed that a failed reciprocity between efforts and rewards was a significant predictor of both ITL profession (H1a) and ITL organization (H1b) one year later. Our findings were in particular, in agreement with two other, though, cross-sectional studies testing ERI in association with intent to leave (Hasselhorn et al., 2004; Kinnunen et al., 2008). In the study by Kinnunen et al. (2008), the ERI model was applied to organizational turnover intentions among 1,301 Finnish managers. The study by Hasselhorn et al. (2004) was based on the total European baseline data of a large sample of 21,229 healthcare workers.

In the present study, the intrinsic hypothesis (H2) was not confirmed. Highly overcommitted nursing staff members did not seem to have an elevated risk for experiencing a high intent to leave one year. This is in line with the cross-sectional results of the study by Kinnunen et al. (2008) who also did not found support for the intrinsic hypothesis. Hasselhorn et al. (2004) however, obtained support for the intrinsic hypothesis tested on ITL profession. Although, the association between OC and intent to leave was weaker than between ERI and intent to leave.

Not finding support for the intrinsic hypothesis could possibly be ascribed to the fact that ERI and OC may have different time lagged effects (van Vegchel et al., 2005). ERI might have shorter-term effects, the effects of OC on intent to leave might be postponed, as a cause of which no effects of OC were measurable after one-year follow-up. Another possible explanation could be attributed to the OC component itself. Preckel, Meinel, Kudielka, Haug, and Fischer (2007) mentioned that it would be interesting to further clarify the 'overcommitment' construct since its scale items suggest certain conceptual ambiguity. Siegrist (2008) suggested to make a differentiation between two possible sources of OC: informal pressure imposed on employees by their work environment and truly intrinsic motivation of employees. Another explanation might be that OC is a less important characteristic in healthcare compared to other populations (van Vegchel et al., 2001). Other personal characteristics might be more important, like commitment (Stordeur et al., 2007).

Compared to the other two hypotheses, the interaction hypothesis has been less examined in literature (12 out of 52 studies) and no consistent results have been obtained with regard to job-related well-being outcomes (van Vegchel et al., 2005). In our study, no support was found for the interaction hypothesis (H3). OC did not seem to modify (i.e. increase) the effect of ERI on intent to leave 1 year later. This result dif-



ferred from the findings of the cross-sectional study by Kinnunen et al. (2008) in which moderate support for the interaction hypothesis of the ERI model was found. The lack of support for this hypothesis may be due to our proper study population. In our sample, only a small part of the participants (4.4%) was experiencing an ERI (i.e. ERI ratio higher than 1.0) at baseline. This low prevalence of ERI in comparison with other European countries (Hasselhorn et al., 2004), could be explained by the many job alternatives on the labour market for healthcare workers due to the perceived nurses' shortage and a high employers' demand for healthcare workers. As stated by Siegrist et al. (2004), ERI is the highest when employees are confronted with a lack of job alternatives and job insecurity. In general, this is not the case in Belgian healthcare at present. In addition, the mean level of OC in our sample was also lower in comparison with other European countries with exception of The Netherlands (Hasselhorn et al., 2004). Since Belgium had more favourable results for both ERI and OC, this may have weakened the moderating effect of OC on ERI.

### 4.4.2. Strengths

As indicated before, studies about the ERI model investigating work-related well-being outcome variables (i.e. intent to leave) are rather scarce (van Vegchel et al., 2005). Moreover, the majority of them were using proxy-measures and were based on a cross-sectional design (Bakker, Killmer, Siegrist, & Schaufeli, 2000; Hasselhorn et al., 2004; Kinnunen et al., 2008).

Therefore, a strength of our study is the use of a prospective design, to investigate the ERI model in relation to two turnover intention outcome variables, respectively ITL organization and ITL profession.

Also the fact that all three hypotheses of the ERI model were formally tested in one single study is rather unique (van Vegchel et al., 2005). By excluding participants with high intent to leave at baseline, an appropriate design was assured. Another methodological strength was the use of the standardized questionnaire, developed by Siegrist et al. (2004), to measure the components of the ERI model and the proper adjustment for confounding variables.

### 4.4.3. Limitations

A notable limitation of our study is that sample attrition may have affected our results. From the initial 4,257 participants, only 1,531 of them were involved in both Times 1 and 2 measurements. A comparison between respondents and non-respondents suggested a healthy worker effect. Those who did not return the second questionnaire, were those who suffered from more adverse working conditions at baseline (i.e. higher efforts and lower rewards). Consequently, our findings may be underestimated due to this sample bias.

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More detailed post hoc subject attrition analyses (data not shown), based on Goodman & Blum (1996) revealed that in our data set substantial attrition led to non-random sampling, which affected the means and variances of some of the variables, but not the underlying relationships among the variables. Therefore, because longitudinal data analyses were performed, we can be confident that subject attrition did not affect our results.

Another possible weakness is the use of self-reported measures for the predictor and both dependent variables (ITL profession and ITL institution), through which a common method bias might have played a role. Although, Spector (2006) recently stated that these influences are not as high as could be expected. In addition, it has been suggested that the use of self-report measures for both exposure and outcome variables is less problematic when there is a prospective design (Tennant, 2001; Theorell & Hasselhorn, 2005) and it even may be regarded as an advantage, since in the phases of 'leaving the institution' or 'the profession', the (subjective) perception is essential.

Finally, longitudinal designs do not automatically prove causality (Zapf, Dormann, & Frese, 1996). Therefore, it would be interesting to investigate different types of causation. The relation between ERI and intent to leave could also be explained by reversed causal relations such that high turnover intentions at baseline elicit (the development of) an ERI 1 year later. Alternatively, even reciprocal (bidirectional) relations in which ERI and intent to leave mutually influence each other are plausible (Shimazu & de Jonge, 2009). Unfortunately, in the present study, we were not able to study alternative assumptions concerning reciprocity and reversed causation, since ERI was only measured at baseline.

### **4.4.4. Study implications**

Despite these limitations, our results clearly support the predictive value of experiencing an ERI for turnover cognitions such as turnover intentions with regard to the profession and the current job 1 year later (cf. extrinsic ERI hypothesis).

If organizations want to effectively manage turnover of healthcare workers, they need to understand how to influence the decision-making process whereby nursing staff think about quitting. Management interventions at early stages in this process could reduce such thoughts and stifle the momentum of quitting before an employee develops firm intention to search for a new job.

In terms of practical implications, our results suggest that improving the working conditions by increasing the rewarding aspects of work and/or decreasing efforts could be efficient for reducing turnover intentions, especially to counter ITL organization and/or ITL profession. However, other approaches may be preferable, depending on the type of healthcare organization, gender, and age. Men and women may attach more importance to different rewarding aspects or are less/more dis-

tressed by certain demanding aspects of work. Probably, the same can be applied to younger versus older healthcare workers. Therefore, it may be desirable to investigate the separate effects of the different types of rewards and efforts on healthcare workers' turnover intentions and other well-being indicators. Another challenging research revenue is to explore whether the use of job specific operationalization of job demands and job resources (e.g. cognitive, emotional, and physical) as described by de Jonge and Dormann (2003), provides additional support for the extrinsic hypothesis.

Further research could also focus on the boundary conditions (moderators such as labour market, economic climate) under which the ERI model predicts withdrawal behaviours (e.g. turnover), or could explore interrelations between turnover cognitions (e.g. thinking of quitting, intention to quit, intention to search) and actual organizational and professional turnover in healthcare and non-healthcare employees.

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## **Chapter 5. THE IMPACT OF EFFORT-REWARD IMBALANCE AND LEARNING MOTIVATION ON TEACHERS' SICKNESS ABSENCE**

Derycke, H., Vlerick, P., Van de Ven, B., Rots, I., & Clays, E. (2012). The impact of effort–reward imbalance and learning motivation on teachers' sickness absence. *Stress and Health*, 29, 14-21.

## **The impact of effort-reward imbalance and learning motivation on teachers' sickness absence**

### ***Abstract***

The aim of this study was to analyze the impact of the effort–reward imbalance and learning motivation on sickness absence duration and sickness absence frequency among beginning teachers in Flanders (Belgium).

A total of 603 teachers, who recently graduated, participated in this study. Effort–reward imbalance and learning motivation were assessed by means of self-administered questionnaires. Prospective data of registered sickness absence during 12 months follow-up were collected. Multivariate logistic regression analyses were performed.

An imbalance between high efforts and low rewards (extrinsic hypothesis) was associated with longer sickness absence duration and more frequent absences. A low level of learning motivation (intrinsic hypothesis) was not associated with longer sickness absence duration but was significantly positively associated with sickness absence frequency. No significant results were obtained for the interaction hypothesis between imbalance and learning motivation. Further research is needed to deepen our understanding of the impact of psychosocial work conditions and personal resources on both sickness absence duration and frequency. Specifically, attention could be given to optimizing or reducing efforts spent at work, increasing rewards and stimulating learning motivation to influence sickness absence.

## 5.1. Introduction

Sickness absence is an important occupational problem that can have adverse effects for both individuals and organizations (Bakker, Demerouti, de Boer, & Schaufeli, 2003). This is also the case in the field of education. Belgian teachers, who worked in the Flemish Community, were in 2009 on average 14.3 days absent from work because of illness (Ministry of the Flemish Community, 2009). Sickness absences can be problematic because teachers who are absent need to be temporarily replaced by a teacher from the existing staff or an external teacher, implying respectively fluctuations in staff workload and financial costs (Eurydice, 2002). Planning teachers' replacement can be complicated because sickness absence is generally unpredictable and can vary in length, from very short periods (i.e. 1 day) to longer periods. When a teacher is absent unexpectedly, their classes can suffer disruption. This is especially the case for frequent short-term sick leaves, when the school fails to find immediately an appropriate substitute to cover for the absent teacher. Subsequently, all classes lectured by this teacher are skipped for this period, which can be detrimental for the educational institutions and, in particular, for their pupils. However, unlike long-term sickness absence, which is less common and occurs more frequently among middle-aged and older teachers, shorter-term sick leaves occur more frequently and are common among younger teachers (Blank & Diderichsen, 1995). In general, almost half of the younger teachers (<36 years) in the Flemish Community, who had been on sick leave, were absent for short periods (Ministry of the Flemish Community, 2009). The youngest teachers (<25 years) were in total, on average, 5 days absent from work because of illness. For the teachers between 26 and 35 years, this was already 5.4 days for men and 9.6 days for women (Ministry of the Flemish Community, 2009). The total number of sickness absence days appeared to be higher with increasing age (Ministry of the Flemish Community, 2009). In contrast to the younger age categories, more than 60% of the older teachers (>45 years), who had been on sick leave, were absent for more than 1 month (Ministry of the Flemish Community, 2009).

Sickness absence is a complex phenomenon that is influenced by a number of social, organizational, personal and non-work-related factors, such as employees' health and life style, socio-demographic factors and physical and psychosocial job-related characteristics (i.e. workload, physical workplace) (Dekkers-Sanchez, Hoving, Sluiter, & Frings-Dresen, 2008, Virtanen et al., 2008). Sickness absence can be divided in two components: sickness absence duration and sickness absence frequency (Bakker et al., 2003). Absence duration is defined as the total length of time (e.g. number of days) an employee has been absent from work over a certain period regardless of the number of absence episodes. Absence frequency is specified as the number of episodes or spells an employee has been absent from work during a specified period, regardless of the length of each of those episodes (Steel, 2003). In line with Bakker et al. (2003), it is

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assumed in this study that sickness absence duration and frequency result from a coping process. Absence duration is considered as an indicator of 'involuntary absenteeism' resulting from the inability rather than the unwillingness to work, for instance as a result of involuntary factors such as illness due to a reaction to job stress (Steel, 2003). Contrary to absence duration, absence frequency is considered to be an indicator of 'voluntary absenteeism' and can be interpreted as a way for employees to withdraw from adverse work conditions (Schaufeli, Bakker, & Van Rhenen, 2009). Although absence frequency has been found to be related to employees' motivation (Bakker et al., 2003), involuntary factors such as physical symptoms (e.g. headaches) induced by stress may also lead to frequent absences.

In general, sickness absence has been acknowledged to be an indirect measure of employees' health and well-being (Griep, Rotenberg, Chor, Toivanen, & Landsbergis, 2010; Head et al., 2007). So, to improve employee well-being and to reduce sickness absence, it is essential to understand why teachers take sick leaves. An adverse psychosocial work environment has received growing attention as a potential antecedent of sickness absence (Head et al., 2007). However, most empirical studies examining the relations between the psychosocial work environment and sickness absence have been cross-sectional (Head et al., 2007) and focused almost exclusively on sickness absence duration, thereby neglecting sickness absence frequency (Schreuder, Roelen, Koopmans, Moen, & Groothoff, 2010). Moreover, in earlier research, the job-demand control support (JDCS) model (Karasek, 1979; Karasek & Theorell, 1990) was commonly used as a proxy of the psychosocial work environment, whereas the effort–reward imbalance (ERI) model (Siegrist, 1996) has been applied to a lesser extent on sickness absence (Allebeck & Maste-kaasa, 2004; van Vegchel, de Jonge, Bosma, & Schaufeli, 2005). Nevertheless, the ERI model may have some distinct advantages in comparison with the JDCS model. Marmot, Siegrist, Theorell, and Feeny (1999) argued that the ERI model might have more power for explaining stress in the service occupations and professions, in particular those dealing with person-based interaction such as teachers. Another advantage of the ERI model is that it also takes into account personal variables (e.g. employees' resources) (Siegrist, 1996).

The ERI model is based on the premise that a failed reciprocity between high efforts spent at work and low occupational rewards received (ERI) elicits a state of emotional distress, which in turn can result in a sustained stress reaction and adverse effects on health and employee well-being (cf. labelled by Siegrist et al., 2004 as the extrinsic hypothesis). It is assumed that employees will not passively remain in a high effort–low reward situation but instead will try to reduce their efforts and/ or maximize their rewards (van Vegchel et al., 2005) by means of homeostatic regulation processes, which involve self-regulation processes to cope with states of psychological imbalance at work induced by stressors at work (Pomaki & Maes, 2002; Vancouver, 2000). In this view, being absent from work because of illness might be viewed as a coping mecha-

nism to deal with an ERI (cf. involuntary absenteeism). In addition, recurrent reward frustration was found to reduce commitment and motivation of employees and to increase withdrawal behaviour (cf. voluntary absenteeism) (Godin & Kittel, 2004).

Besides situation-specific (extrinsic) work characteristics such as effort and reward, an intrinsic component is included in the ERI model, namely overcommitment. Overcommitment refers to an exhaustive work-related coping style. Overcommitted employees underestimate challenging situations and overestimate their own capacities; they tend to exaggerate their efforts (Siegrist et al., 2004; van Vegchel et al., 2005). As a result, their susceptibility to reward frustration is increased (Siegrist et al., 2004). Employees who are highly overcommitted, which possibly results in continued exaggerated efforts combined with disappointing rewards, are expected to have an increased risk of developing negative emotions that can cause possible adverse effects on health and employee well-being (cf. labelled by Siegrist et al., 2004 as the intrinsic hypothesis). Consequently, employees experiencing high levels of overcommitment are assumed to respond with more strain reactions to an ERI, in comparison with their less overcommitted colleagues (Siegrist et al., 2004; Tsutsumi & Kawakami, 2004) (cf. labelled by Siegrist et al. (2004) as the interaction hypothesis).

Both the intrinsic and interaction hypotheses have been less frequently investigated, and the findings for these hypotheses have been less consistent, especially with regard to sickness absence (van Vegchel et al., 2005). This might be attributed to the overcommitment concept itself. According to Preckel, Meinel, Kudielka, Haug, and Fischer (2007), the scale items from the 'overcommitment' construct suggest certain conceptual ambiguity. In addition, Siegrist (2008) suggested to make a differentiation between two possible sources of overcommitment: informal pressure imposed on employees by their work environment and truly intrinsic motivation of employees.

Intrinsic motivation refers to the extent to which an employee is excited about a work activity and engages in it for the sake of the activity itself. Intrinsically motivated employees are assumed to be more innovative and typically have a high learning motivation (LM), next to being curious, cognitive flexible, risk taking and persistent in the face of barriers. In contrast, employees who are not driven by the love of the job itself but are more motivated by external rewards such as acknowledgement, status or salary would appear to be less innovative on the job and show less LM (Zhou & Shalley, 2003).

Because of the particularity of the teaching profession and the relevance and importance of LM for students and their teachers, we focused in the current study on the latter and substituted the generic overcommitment construct of the ERI model by the intrinsic component LM.

The ERI model focuses on the afflictions of self-esteem that result from reward frustration due to a failed social reciprocity between the

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efforts spent and the perceived inappropriate rewards (Siegrist, 2008). Opposed to the general concept of overcommitment, LM may be considered as a positive coping mechanism to deal with this perceived failed reciprocity and to enhance employees' self-esteem. Moreover, being highly motivated to learn new things at work can influence the way employees appraise their job demands (i.e. efforts) and value work-related rewards (Taris, 2004).

The concept of LM refers to the degree to which employees report themselves to be motivated to learn new behaviour patterns and skills on their job and to how keen they are to solve problems at their job and to adapt to the environment (Taris, 2004). Teachers in Flanders (Belgium) have been confronted with recurrent changes in the education system for instance due to curriculum reforms (Aelterman, Engels, Van Petegem, & Verhaeghe, 2007). These changes force teachers to deal with new circumstances, which may cause strain-inducing situations (Verhaeghe, Vlerick, Gemmel, Van Maele, & De Backer, 2006). Having a high LM could be considered as a personal resource, which enables teachers to adapt easier to these changes. Accordingly, we assume that having high LM protects teachers from being absent from work (cf. intrinsic hypothesis).

Additionally, previous research has indicated that excessive job strain adversely influences LM (Taris, Kompier, De Lange, Schaufeli, & Schreurs, 2003). So, we presume that teachers experiencing a high ERI will be even more absent from work if they also have a low level of LM (cf. interaction hypothesis).

Nevertheless, up till now, the relationship between ERI, LM and sickness absence in teachers has never been studied in a prospective way. In addition, scientific research on sickness absence among beginning teachers is almost completely lacking. However, newly graduated teachers, who enter the educational work environment for the first time, represent an interesting group of employees given that at the start of their career, they have to go through a socialization process that shapes their adaptation to the physical and social-cultural setting in which they work (Vandenberghe, Panaccio, Bentein, Mignonac, & Roussel, 2011). Undergoing this process may be quite stressful and might in turn be related to sickness absence. Additionally, this group of neophyte teachers is characterized by high attrition levels; more than 30% of the beginning teachers in secondary schools in Flanders leave their teaching job within 5 years (Ministry of the Flemish Community, 2011; Sharplin, O'Neill, & Chapman, 2011). Teachers' attrition, which can be considered as a more drastic form of withdrawal behaviour than sickness absence, is found to be influenced by personal factors and psychosocial work characteristics (Borman & Dowling, 2008; OECD, 2005). Because beginning teachers have not yet been exposed for years to stressors related to their psychosocial work environment, it is specifically interesting to investigate the relations between psychosocial work conditions and sickness absence.

Therefore, the aim of the present study was to investigate the impact of ERI, LM and their interaction on both sickness absence duration and frequency in a sample of beginning teachers.

### 5.1.1. Study hypothesis

*Hypothesis 1 (extrinsic hypothesis): An imbalance between high occupational efforts and low rewards is positively associated with longer sickness absence duration (H1a) and more sickness absence episodes during 12 months follow-up (H1b).*

*Hypothesis 2 (intrinsic hypothesis): A low level of LM is positively associated with longer sickness absence duration (H2a) and more sickness absence episodes during 12 months follow-up (H2b).*

*Hypothesis 3 (interaction hypothesis): Effort–reward imbalance in combination with a low level of LM is even stronger positively associated with longer sickness absence duration (H3a) and more sickness absence episodes during 12 months follow-up (H3b).*

## 5.2. Methods

### 5.2.1. Study sample

A prospective design was used for data collection. Firstly, a questionnaire was sent out in autumn 2004 to all 4735 teacher education graduates (graduated between 2002 and 2004) of the teacher training institutes affiliated to the Ghent University Association in Flanders (Belgium). In total, 1756 teacher education graduates returned their questionnaire, corresponding to a response rate of 37%. For all 776 participants who worked as a teacher during the baseline assessment and who remained working in the teaching profession during the 1-year follow-up, sickness absence data were gathered. For 108 of them, no complete sickness absence data could be collected, and they were excluded from further analyses. Another 65 respondents were excluded because they did not give an informed consent to obtain their sickness absence data. Finally, a total of 603 beginning teachers, of which the absenteeism data could be linked to the baseline questionnaire by means of a unique code, were included in the prospective analyses.

### Ethical considerations

The institutional review board of the coordinating university approved the design of this study. All participants received a letter explaining the purposes and procedures of the study, and anonymity and confidentiality were assured. Consent to participate was assumed by return of the questionnaire and by their given informed consent to obtain their sickness absence data from the Department of Education of the Ministry of the Flemish Community. The Department of Education is authorized to register all sickness absences for teachers employed in Dutch-speaking schools from the Flemish Community and provides a unique registration number to all beginning teachers. This unique code

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identifier was used to match the respondents' responses with the sickness absence data.

### **5.2.2. Measures**

#### **Baseline predictors**

##### *Effort*

Effort was measured by six items (Siegrist et al., 2004), measuring demanding aspects of the work environment: work pressure, time pressure, responsibility, working overtime, increasing demands and physical load. Items were answered in two steps. In the first step, participants had to indicate whether an item content described a typical experience of their job. The answer categories were 'yes' and 'no'. If they agreed, participants had to evaluate in the second step on a four-point rating scale to what extent they usually felt distressed by this typical experience. The overall effort score was ranging from 6 to 30. The higher the score, the higher the level of distress. The Cronbach's alpha for the effort scale was 0.59.

##### *Reward*

Reward was measured by 11 items (Siegrist et al., 2004), covering different rewards: financial reward (one item: salary), esteem reward (five items, e.g. respect and support) career opportunities (four items, e.g. promotion opportunities) and job security (one item). The rating and scoring procedure was the same as for the effort scale. The overall reward score varied between 11 and 55. The higher the score, the more rewards the job offers. Cronbach's alpha for the reward scale was 0.74.

The main recommended formulation to calculate ERI was applied, namely the ratio term of the effort score divided by the reward score, taking into account a correction factor because of the unequal number of items in the nominator and denominator (6/11) (Siegrist & Peter, 1996). A value close to 0 indicates a favourable condition (relatively low effort, relatively high reward), whereas values beyond 1.0 indicate a critical condition of high costs (efforts) and low gain (rewards). The ratio can either be used as a continuous variable or be transformed into a binary variable (values  $\leq 1$  versus  $> 1$ ). In our study sample, the prevalence of a ratio above 1 at baseline was 6.3%. Because of this low prevalence, our formulation of ERI may diminish statistical power. In line with Head et al. (2007), based on the continuous variable, tertiles were defined ranging from 'low' to 'medium' and 'high'. The respondents in the high ERI group were defined as the people at risk.

##### *Learning motivation*

Learning motivation was measured by the Learning Motivation scale developed by Taris et al. (2003) and refers to the degree to which



employees are enabled and stimulated to acquire new knowledge and skills and to solve problems in their job. This scale consists of three items scored on a four-point Likert scale, ranging from 1 (never) to 4 (always). Two items assessed the degree to which participants were actively looking for situations in which they could expand their skills ('I am constantly looking for new challenges in my job', and 'I spend much energy in keeping up with recent developments'). The third item measured whether the participants were willing to invest time and effort in dealing with difficult situations, which is a precondition for acquiring new skills ('When things seem to go wrong, I increase my efforts and keep on trying'). Consistent with ERI, LM was categorized in tertiles: 'low', 'average' and 'high' LM. Teachers within the low LM group are considered to be in the most unfavourable group. Cronbach's alpha for the LM scale was 0.62.

### **Outcome measures**

Sickness absence data were collected during the 12 months following the baseline questionnaire. Only absence from work due to sickness was considered; pregnancy and maternity leaves were not included. Only objective sickness absence data registered by the employer were used in this study. Both sickness absence duration (total number of sick leave days) and frequency (total number of sick leave episodes) were collected during the 1-year follow-up period.

### **5.2.3. Data-analysis**

In our study, both outcome variables sickness absence duration and frequency were positively skewed (skewness scores of 9.06 and 1.49, respectively). Therefore both outcome variables were dichotomized. Long sickness absence duration was defined as more than 3 days sick leave during the 1-year follow-up, corresponding to the 78th percentile. A high sickness absence frequency was defined as minimum two sickness absence episodes or more during the follow-up period, corresponding to the 77th percentile.

Multivariate logistic regression analyses were performed to test all three hypotheses. For the test of the extrinsic and intrinsic hypotheses, gender and family situation were included in the logistic model, since Chi-square tests revealed that these variables were significantly associated with both sickness absence indicators (data not shown). To examine the extrinsic and the intrinsic hypotheses, the two components (ERI ratio and LM measured at baseline) were introduced separately in a model to assess their relative contribution to the estimation of both sickness absence indicators. For the interaction hypotheses, the two components together with the interaction term  $ERI \times LM$  were entered in the model in a single step. For both components, a dichotomous variable was made comparing respectively the highest (for ERI) and lowest tertiles (for LM) with the remaining tertiles. Analyses were performed using SPSS statistical package, version 15.0 (SPSS Inc, Chicago, IL, USA).

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### **Drop-outs**

Following procedures recommended by Twisk (2003), several analyses were conducted to find out if drop-outs (i.e. respondents who refused to release their sickness absence data) ( $n = 65$ ) differed from respondents for whom sickness data could be obtained ( $n = 603$ ). A logistic regression analysis was performed to assess whether gender, family situation and respectively LM and ERI were associated with the absence of sickness absence data. Respondents with a low ERI [odds ratio (OR) 2.67; 95% confidence interval (CI) 1.338–5.326] and high LM (OR 3.57; 95% CI 1.630–7.835) were more likely to refuse to release their sickness absence data compared with respondents with respectively a high ERI and a low LM.

In addition, independent sample t-tests were performed to compare the ERI and LM scores between the 603 respondents and the 65 drop-outs. The group of respondents with sickness absence data reported a slightly higher ERI score (0.61 versus 0.55;  $p = 0.05$ ) and a somewhat lower LM (9.1 versus 8.5;  $p < 0.001$ ) compared with the drop-outs group. Although these results are statistically significant, the differences in means represent only less than 6% of the range of the respective scales.

### **5.3. Results**

The description of socio-demographic variables, sickness absence, ERI and LM in the study population is presented in Table 5.1. Our study sample consisted mainly of women (76.3%) and 143 (23.7%) men. The mean age of the teachers was 26.5 years and ranged from 21 to 54 years. The average seniority in the teaching profession was 2.3 years. The majority of them was working full time (85.5%), and 90.7% had a temporary contract.

During the 12 months follow-up, the mean sickness absence duration was 3.0 days, ranging from 0 to 137 days, and the average absence frequency was 0.83 times, ranging from 0 to 6 times. In total, 52.1% of the beginning teachers was never absent during the 1-year follow-up, 22.6% were frequently absent (two times or more) and 21.6% were absent for a longer period (more than 3 days). Of the participants, 6.3% reported an ERI score above 1, and the mean level of LM was 8.50.

Table 5.1. Description of socio-demographic characteristics, sickness absence, effort-reward imbalance and learning motivation (n=603)

Baseline and outcome variables	n	%	Mean (SD)
<i>Age</i>			26.52 (5.74)
<i>Seniority in teaching profession</i>			2.28 (2.22)
<i>Gender</i>			
Male	143	23.7	
Female	460	76.3	
<i>Education level</i>			
Higher education for social promotion	35	5.8	
Bachelor degree	359	59.5	
Master degree	200	33.2	
<i>Family situation</i>			
Living with partner	315	52.2	
Living alone	74	12.3	
Living with family/friends	214	35.5	
<i>Work situation</i>			
Full-time	515	85.5	
Part-Time	87	14.5	
<i>Working contract</i>			
Permanently appointed	22	3.7	
Partially appointed	34	5.7	
Temporary contract	543	90.7	
<i>Type of education</i>			
Nursery school	45	7.6	
Elementary school	157	26.6	
Secondary school	361	61.6	
Other	25	4.2	
<i>Sickness absence duration</i>			3.00 (8.60)
<i>Sickness absence frequency</i>			0.83 (1.10)
<i>ERI</i>			0.61 (0.24)
ERI ≤ 1	491	93.7	
ERI > 1	33	6.3	
<i>LM</i>			8.50 (1.52)

Note. ERI: Effort-reward imbalance; LM: Learning motivation; SD: Standard Deviation.

### Hypothesis 1

The results showed that in comparison with respondents having a low effort-reward imbalance (Tertile 1: T1), a high effort-reward imbalance (T3) was positively associated with a sickness absence duration of more than three days (OR 1.87). Also, the respondents experiencing a medium effort-reward imbalance (T2) had an increased risk for having sickness absence duration for more three days (OR 1.94). In addition, our findings showed that compared to respondents experiencing a low effort-reward imbalance, a high effort-reward imbalance (T3) was positively associated with being absent for more than one episode (OR 2.04). These findings supported the first hypothesis with regard to both sickness absence outcomes (see Table 5.2).

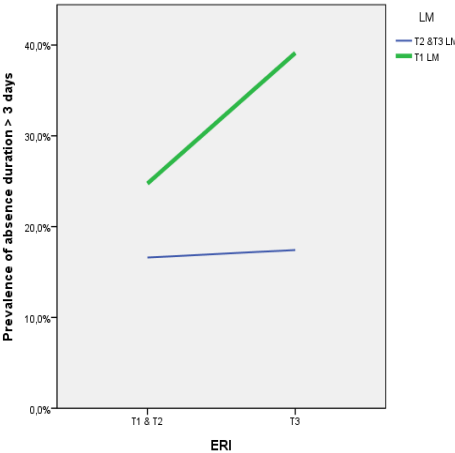
**The impact of effort-reward imbalance and learning motivation on teachers' sickness absence**

**Hypothesis 2**

Respondents experiencing a low learning motivation had a 1.76 higher chance of having a sickness absence frequency of more than one episode compared with the respondents having a high learning motivation. People having a low learning motivation had a higher chance of being absent for work for more than three days in comparison with respondents having a high learning motivation, although our findings did not reach statistical significance (see Table 5.2). So, the second hypothesis was partly confirmed.

**Hypothesis 3**

For the interaction between ERI and LM no statistically significant results were obtained for both sickness absence indicators (data not shown). However, a trend was noticeable for the interaction term between ERI and LM in relation to sickness absence duration (see Figure 5.1). For teachers experiencing a medium or high level (T2 & T3) of learning motivation the risk of having a sickness absence duration of more than three days increased slightly when having increased effort-reward imbalance (OR 1.06; 95% CI 0.604-1.863). This was in contrast to the low learning motivation group (T1) who had a clear elevated risk of having a sickness absence duration of more than three days in case of a high level of effort-reward imbalance (OR 1.96; 95% CI 0.923-4.142). So, on the whole, no significant results were found that support hypothesis 3. However, teachers experiencing a high effort-reward imbalance in combination with a low level of learning motivation seemed to have an even higher chance of being absent for more than three days.



*Figure 5.1. The impact of effort-reward imbalance (ERI) and learning motivation (LM) on sickness absence duration of more than three days.*

Table 5.2. Multivariate associations between effort-reward imbalance, learning motivation and sickness absence duration and frequency

Sickness absence duration (> 3 days)								Sickness absence frequency (> 1 time)							
	<i>B</i>	SE	Wald	df	OR	95% CI		<i>B</i>	SE	Wald	df	OR	95% CI		
						Lower	Upper						Lower	Upper	
ERI <sup>a</sup>															
Low (ref.)					1							1			
Medium	0.661	0.290	5.218*	1	1.94	1.098	3.418	0.419	0.284	2.176	1	1.52	0.871	2.656	
High	0.627	0.290	4.679*	1	1.87	1.061	3.301	0.713	0.275	6.736**	1	2.04	1.191	3.493	
LM <sup>a</sup>															
Low	0.461	0.282	2.678	1	1.59	0.913	2.755	0.564	0.283	3.979*	1	1.76	1.010	3.062	
Medium	0.235	0.269	0.761	1	0.79	0.467	1.340	0.080	0.269	0.089	1	0.92	0.545	1.563	
High (ref.)					1							1			

Note. ref.: reference category; OR: odds ratio; CI: confidence interval; df: degrees of freedom; ERI: effort–reward imbalance; LM: learning motivation; SE: standard error.

<sup>a</sup>Adjusted for gender and family situation.

\*p < 0.05; \*\*p < 0.01.

## **5.4. Discussion**

The general aim of this prospective study was to examine the impact of ERI and LM on sickness absence among a sample of beginning teachers. Two types of absence were distinguished, namely sickness absence duration and sickness absence frequency.

The central hypotheses were that ERI, a low level of LM and their interaction would have an unfavourable effect on sickness absence duration and frequency. Support was found for the first (extrinsic) hypothesis and partially for the second (intrinsic) hypothesis, but no significant results were obtained for the third (interaction) hypothesis.

Our results revealed that an imbalance between high efforts and low rewards was positively associated with sickness absence duration of more than 3 days (H1a) and more frequent absence episodes (two or more episodes) (H1b). For sickness absence duration, our findings were in line with previous research by Godin and Kittel (2004). However, in their study, no significant relation was found between ERI and sickness frequency among a sample of 3084 Belgian employees.

The second hypothesis was only partially confirmed. Low levels of LM were found to be positively associated with sickness absence frequency but not with sickness absence duration. This could possibly be explained by the fact that both sickness absence measures result from different processes. Whereas sickness absence duration is considered to be the result of a health impairment process, sickness absence frequency is assumed to result from a motivational process (Bakker et al., 2003). If employees are not intrinsically motivated to learn new skills and behaviours and to adjust to new situations, this may lead to a form of withdrawal behaviour, resulting in more frequent absence spells. Because the present study is the first to study the impact of teachers' LM on sickness absence, comparison with other studies is not possible. However, studies by Bakker et al. (2003) and Schaufeli et al. (2009) revealed that respectively organizational commitment and work engagement, both also positive personal variables, were significant predictors of sickness absence frequency but not of sickness absence duration.

In the present study, none of the prospective analyses showed a significant interaction effect for the third hypothesis, which stated that the combination of high ERI and low LM would result in even longer and more frequent absence spells. However, a tendency for an interaction effect was noticeable for sickness absence duration, which suggested that a high level of LM may have a protective effect on the adverse relation between ERI and sickness absence duration of more than 3 days.

The major strength of our study lies in its methodological qualities. Firstly, the impact of ERI and LM on sickness absence was assessed using a prospective research design. Secondly, objective registered data of sickness absence were used, which provided a more valid measure

compared with self-reported sickness absence data. Another strength of the current study is that employees' LM instead of overcommitment was used as a conceptualization of the intrinsic component of the ERI model, reflecting the potential importance of personal variables next to work-related characteristics for understanding job-related outcomes such as sickness absence.

However, the present study shows several limitations. The prevalence of sickness absence was rather low in our sample compared with the teachers' sickness absence data reported by the Flemish Community (Ministry of the Flemish Community, 2009). According to this report, teachers were on average 14.3 days absent from work because of sickness, and 45.6% of them was never absent because of sickness during 2009 (Ministry of the Flemish Community, 2009). In our sample, in total, 52.1% of the respondents were never absent during the follow-up period, and the mean number of absence days due to illness was 3 days. Although almost a quarter of our sample was frequently absent or was absent for a longer period, this is a rather low number in comparison with the teacher population of the Flemish Community (Ministry of the Flemish Community, 2009). This rather low number could possibly be explained by the fact that the study sample consisted mainly of teachers in the beginning of their career with an average age of 26.5 years, of which most of them had a temporary contract. In this career phase full of uncertainty and challenges, beginning teachers can perceive more absence thresholds or experience more pressure to attend at work compared with their permanently appointed colleagues who have more job security. Another explanation might be that among recently graduated teachers, the time lagged effects of ERI on sickness absence have not yet been established because of the relatively short follow-up period.

It is acknowledged that the items used to measure effort, reward and LM in the present study could have been more specific to the actual role of beginning teachers. In particular, this may have been reflected in the rather low reliability scores for effort and LM. However, this limited reliability due to a weak internal inconsistency might have resulted in a less precise estimation of the true associations between ERI, LM and sickness absence and consequently to an underestimation of these relations. In future research, it would be interesting to work with more context-specific operationalizations for the items measuring effort, reward (e.g. wages, temporary versus permanent contract) and LM among beginning teachers.

Another issue is that 65 of the respondents who completed the questionnaire disagreed to release their sickness absence data. Several analyses were performed to test if drop-outs (i.e. respondents without sickness absence data) differed from respondents for whom sickness data could be obtained ( $n = 603$ ) (Twisk, 2003). With respect to the study variables, there were significantly more drop-outs among those who had a lower ERI and a higher LM score. In addition, the mean

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scores for both independent variables were significantly different between both groups, but the mean differences were rather small, representing less than 6% of the range in both scales.

Despite these limitations, our results suggest that ERI and low levels of LM are associated with sickness absence among beginning teachers. So, to effectively influence the duration and frequency of absenteeism, specific countermeasures have to be taken. This could be done by improving the working conditions through increasing the rewarding work aspects and/or changing the perception of efforts spent. An additional way is stimulating learning motivation. Earlier research has indicated (Taris et al., 2003; Taris & Feij, 2004) that job strain negatively affects learning motivation, although studies assessing other predictors of low learning motivation are almost completely lacking. Therefore, further research is needed to find pathways to maintain and improve learning motivation in order to reduce employees' sickness absence.

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## **Chapter 6. THE MENTORING STYLE OF PH.D. SUPERVISORS AND ITS INFLUENCE ON THEIR STUDENTS' WELL-BEING**

Derycke, H., Levecque, K., & Van Rossem, R. The mentoring style of Ph.D. supervisors and its influence on their students' well-being. *Submitted*

## **The mentoring style of Ph.D. supervisors and its influence on their students' well-being**

### ***Abstract***

The aim of this paper was to examine if the work-related well-being of Ph.D. students depends on the mentoring style of their Ph.D. supervisor and to what extent this effect of mentoring style is mediated by the students' psychosocial working conditions. These conditions include job demands, job control and co-worker support. Structural equation modelling was applied on a sample of 1887 Ph.D. students from four universities in Flanders (Belgium). Students with an authoritative supervisor experienced higher job demands. Job control, co-worker support and work-related well-being of Ph.D. students were found to be lower when the mentor was authoritative and higher when he/she had a supportive mentoring style. When supervisors were perceived as both authoritative and supportive, the beneficial effects of a supportive mentoring style on students' work-related well-being disappeared. Job demands negatively affected work-related well-being, while job control and co-work support had a positive effect. These results indicated that a supportive and an authoritative mentoring style had counterbalancing effects on Ph.D. students' work-related well-being and that these effects were partially mediated by one's psychosocial working conditions.

## 6.1. Introduction

As more and more OECD countries are transforming into knowledge economies and societies, the need for highly educated workers has increased sharply. As doctoral students are specifically trained to conduct research, they are considered key contributors to future innovation- and knowledge-based economic growth (Auriol, 2010; Enders, 2005).

This paper focuses on the situation of doctoral students in Flanders, the Dutch-speaking part of Belgium. In this region, as well as in other OECD countries, the number of doctorate holders who graduate annually has increased substantially over the past two decades, from 598 in 1995-1996 to 1428 by 2010-2011 (Cyranoski, Gilbert, Ledford, Nayar, & Yahia, 2011; Flemish Ministry for Education and Training, various years). However, despite the increased investments made by the government to provide funding for doctoral projects, not all Ph.D. students are equally successful during their Ph.D. track. Many Ph.D. students never complete their doctorate dissertation or only do so after a long time. Of the cohort that started as junior researchers at a Flemish university in 2000-2001, only 50.5% obtained their Ph.D. within eight years, which was already a substantial improvement over the cohort starting in 1990-1991, of which only 36.5% did so (Groenvynck et al., 2011, p. 62).

Past research has tried to identify factors that contribute to the progress and the timely completion of a dissertation process, thereby mainly focusing on demographic and situational factors including age and gender of Ph.D. students, type of funding, and scientific discipline (Maher, Ford, & Thompson, 2004; Seagram, Gould, & Pyke, 1998; Visser, Luwel, & Moed, 2007). Attention has also been paid to students' psychological and behavioral characteristics (i.e. personal commitment), as well as to diverse aspects of the student-supervisor relationship (i.e. quality of supervision), as potential factors associated with the success or failure of a Ph.D. project (Ives & Rowley, 2005; Kurtz-Costes, Helmke, & Ulku-Steiner, 2006; Maher et al., 2004; Mainhard, van der Rijst, van Tartwijk, & Wubbels, 2009; Martinsuo & Turkulainen, 2011). The well-being of Ph.D. students has largely been ignored (Stubbs, Pyhalto, & Lonka, 2011), although both within the sociology and psychology of work, a substantial body of evidence exists that shows the importance of well-being on job outcomes such as performance and retention (Griffeth, Hom, & Gaertner, 2000; Harrison, Newman, & Roth, 2006). Work-related well-being has been found to be influenced by many aspects of the work environment, including psychosocial job conditions (De Lange, Taris, Kompier, Houtman, & Bongers, 2003; Hausser, Mojzisch, Niesel, & Schulz-Hardt, 2010; van der Doef & Maes, 1998). In this study, we address the well-being of Ph.D. students in Flanders and consider both the supervisor's mentoring style and psychosocial job conditions as possible determinants. Our research question is twofold: 1) How is Ph.D. student's well-being affected by the mentoring style of

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their supervisor? and 2) Is the effect of mentoring style on Ph.D. student's well-being mediated by conditions such as job demands, level of job control and co-worker support?

### **6.1.1. Psychosocial working conditions and well-being**

Concerning the working conditions of employees, there is an abundant international literature reporting significant effects of employees' working conditions on a variety of acute and chronic health conditions and well-being (De Lange et al., 2003; Hausser et al., 2010; van der Doef & Maes, 1998; for Flanders: Vanroelen, Levecque, & Louckx, 2009; Vanroelen, Levecque, Moors, Gadeyne, & Louckx, 2009; Vanroelen, Levecque, Moors, & Louckx, 2010). In this context, job stress models, such as the Demand-Control-Support (DCS) model - which links working conditions to outcomes such as job satisfaction and well-being - (Johnson & Hall, 1988; Karasek, 1979; Karasek et al., 1998) have received considerable attention. The DCS model considers three types of working conditions: job demands, job control and social support (Karasek et al., 1998). Job demands are defined as the psychological stressors in the work environment (e.g. workload, time pressure). Job control or decision latitude refers to the employees' control over tasks and the way they are executed. Job control consists of both skill discretion and decision authority. Skill discretion describes the level of creativity and variety on the job, and decision authority refers to the possibilities for workers to make decisions about their work. Social support refers to the emotional support employees get from their supervisor and/or co-workers. According to the DCS model, employees experiencing high job demands in combination with low co-worker and supervisor support and low job control are most vulnerable for poor health and poor well-being (Karasek et al., 1998).

### **6.1.2. The work-environment of Ph.D. students in Flanders**

There is significant international variation in the conditions under which Ph.D.'s are prepared. In the Flemish Ph.D. system, the majority of doctoral students or junior researchers are university employees. Compared to their Anglo-Saxon counterparts, they receive a generous monthly income that is comparable for all junior researchers regardless of the type of funding source (Visser et al., 2007). They are protected by the Belgian labor legislation, for example with regard to working conditions and employment conditions such as working time and terms of dismissal. However, the Ph.D. production process itself has some characteristics of its own that might cause the *actual* work environment to diverge from the working and employment conditions protected by law. One such relevant characteristic concerns working time. Despite a legal restriction on maximum working time, Ph.D. students are informally expected to be intrinsically motivated and not to restrict their performance to the hours agreed on in their employment contract. This "informal"



expectation often results in high workload and frequent overtime work. Such high job demands might however be compensated by the decision latitude students experience. In principle, the objective of a Ph.D. project is for students to conduct research autonomously, making their own decisions in terms of learning, and developing special abilities and investing in networks. In reality, there is huge variation in the amount of decision latitude granted to Ph.D. students by their supervisor. In case of low decision latitude, social support by co-workers might be essential. Students that lack such support are left to their own device and may get discouraged with their research (Martinsuo & Turkulainen, 2011).

### **6.1.3. Mentoring style, psychosocial working conditions and well-being**

Another important characteristic of the Ph.D. process is the mentoring or leadership style of the Ph.D. supervisor. In Flanders, because of the double status of Ph.D. students as both student and employee, the Ph.D. supervisor is both their academic and administrative supervisor. Although the mentoring style of the supervisor plays an important role in defining the work environment in which Ph.D. students function, it is not captured by the DCS-model. When considering job demands, job control, co-worker support and the mentoring style of supervisor, we might expect significant interrelations. For one, there is the fact that many Ph.D. projects are based on research programs for which funds have officially been granted to the Ph.D. supervisor and not to the student personally. In these cases, Ph.D. students often have less autonomy regarding their doctoral research and there is more pressure to perform as their failure reflects more highly on their supervisor. As concerns co-worker support, the impact of the Ph.D. supervisor might also be significant. Indirectly, the Ph.D. supervisor can influence the opportunity structure of co-worker support, as support from colleagues may largely depend on the size and composition of the research group which the supervisor has formed. More directly, the supervisor may also influence co-worker support by steering the research group climate towards either internal “cooperation” or “competition”. The degree to which Ph.D. students receive supervisor support is expected to be strongly influenced by his or her mentoring or leadership style.

Leadership style refers to sets of behaviors that leaders employ to influence the behaviors of subordinates (Skakon, Nielsen, Borg, & Guzman, 2010). Ph.D. supervisors are expected to provide the time, expertise and support to help and stimulate doctoral students to gain knowledge and develop research skills and attitudes, needed to successfully complete their doctoral project (Mainhard et al., 2009). Meanwhile supervisors also play an important role in the assessment of the quality of the research and the work of the doctoral student (Mainhard et al., 2009). Ph.D. supervisors have to combine the dual role of ‘guide’ and ‘assessor’ (Murphy, Bain, & Conrad, 2007). This may reflect in their mentoring style, which is a combination of two dimensions: support and

## **The mentoring style of Ph.D. supervisors and its influence on their students' well-being**

structure. A supervisor may be supportive and encouraging for example by discussing the research of his/her Ph.D. students on a regular basis and by helping them with the preparation of publications (supportive mentoring style) but at the same time he or she may also be authoritative and directive for example by providing clear direction and by continuously monitoring the Ph.D. students' progress (authoritative mentoring style). Both the support and structure dimension correspond to the characteristics of the theory of situational leadership (Hersey & Blanchard, 1982; Hersey, Blanchard, & Johnson, 2001). The situational leadership theory (SLT) outlines two types of leadership behavior, namely leader's task behavior and relationship behavior. Leader's directive task behavior is based on initiating structure and strongly focuses on the duties and responsibilities of employees by giving them clear rules and instructions. Relationship behavior refers to leader's socio-emotional support and is defined as the extent to which the leader acts in a facilitative and supportive manner (Hersey et al., 2001). Because these directive (task-oriented) and supportive (relationship-oriented) leadership styles are independent of one another, leaders may combine both styles to varying degrees.

Effective leaders are assumed to adapt their leadership style to the specific goals that have to be achieved as well as to meet the needs of their employees (Hersey et al., 2001; Hur, 2008). These needs may change depending on the work context, employees' individual characteristics, and employees' maturity (Hersey et al., 2001; Hersey, Blanchard, & Johnson, 1996; Hur, 2008). The maturity or readiness level refers to employees' ability and willingness to take responsibility for their tasks and the extent to which they mastered the necessary skills to complete these tasks (Hersey et al., 2001; Hersey et al., 1996). The central tenet of the SLT is that an optimal leadership style (defined by specific combinations of task-oriented and relationship-oriented leadership behavior) depends on given levels of employee maturity. As employees' maturity increases, effective leadership behavior will involve less structure and less support (Hersey et al., 2001; Hersey et al., 1996).

Consequently, one could expect that Ph.D. supervisors also can tailor their mentoring style to individual Ph.D. students' changing needs for structure and support when they pass through the different phases of the Ph.D. project and subsequently grow in their role as researcher. However, research has revealed that the leadership style of the supervisor can be seen as a function of his/her personality traits that do not change in accordance with the individual characteristics of employees (Hur, 2008). This indicates that leaders do not necessarily adapt their style to the needs of individual employees but exercise a more stable form of leadership style. It was also suggested by Vecchio (1987) that job level is a more useful and accurate construct within the context of the SLT than individual employee maturity/readiness. In addition, Fernandez & Vecchio (1997) stated that employees may to a certain degree self-select themselves into specific jobs based on their maturity. This may also be

the case for doctoral candidates who start a career at the level of junior researcher.

According to the review by Skakon et al. (2010), various types of mentoring style have generally been found to influence employees' stress and well-being. However, previous research has mainly focused on the association between mentoring style and well-being (Kuoppala, Lamminpää, Liira, & Vainio, 2008) without explaining how mentoring style influences well-being and thereby neglecting that work characteristics may affect this relationship. Only few empirical studies have investigated the relationship between situational leadership and employee well-being, and also failed to take into account work characteristics as possible mediators (Chen & Silverthorne, 2005; Furtado, Batista, & Silva, 2011). Only a couple of studies on transformational leadership indicated that employees' perceptions of work characteristics such as role clarity, meaningfulness of work and opportunities for development, did mediate the relationship between leadership style and employee well-being and job satisfaction (Nielsen, Randall, Yarker, & Brenner, 2008; Nielsen, Yarker, Brenner, Randall, & Borg, 2008). To understand if and how the mentoring style of the Ph.D. supervisor influences PhD students' well-being, the extent of a possible mediating effect by students' perceived psychosocial working conditions needs to be examined.

In sum, the objective of this study is to assess the underlying structure of the direct and indirect relationships between a supportive mentoring style, an authoritative mentoring style, students' psychosocial working conditions (i.e. job demands, job control and co-worker support) and work-related well-being.

## **6.2. Methods**

### **6.2.1. Study sample**

The present study is based on the Survey of Junior Researchers 2008 which was organized between March and December 2008 among junior researchers in four participating Flemish universities in Belgium. The survey covers many topics, including educational and employment history, the Ph.D. project, the mentoring style of the supervisor, and well-being. In total, 2,599 researchers completed the questionnaire (response rate of 44%). Our study is based on information of the 1887 participating junior researchers who were enrolled in a Ph.D. program. Researchers who already defended their Ph.D., who had quit their Ph.D. program or were not yet enrolled in a Ph.D. program, were excluded from the study.

### **6.2.2. Measures**

#### **Work-related well-being**

Work related well-being is approached as a latent variable, composed of three well-being aspects: job satisfaction, pleasure at work and need for recovery after work. The standardized factor loadings are 0.76 for job satisfaction, 0.78 for pleasure at work and -0.34 for need for recovery after work. Job satisfaction is represented by a single question: "To which extent are you in general satisfied with your current job?". Possible answers range from (1) very dissatisfied to (6) very satisfied. Previous research suggests that single-item measures can be acceptable indicators of satisfaction (Wanous, Reichers, & Hudy, 1997). Pleasure at work and need for recovery after work are both measured by the mean score on 5 items (see Chapter 2). Possible answers range from (0) never to (3) always.

#### **Mentoring style of the supervisor**

The mentoring style of the supervisor is assessed by two scales, measuring how strongly Ph.D. students perceive their supervisor to be authoritative and directive (authoritative supervisor) and encouraging and supportive (supportive supervisor) (see Chapter 2). The authoritative mentoring style (AMS) scale comprises of 6 items and the supportive mentoring style (SMS) scale consists of 15 items measuring how involved the supervisor is in the Ph.D. project and how encouraging Ph.D. students find their supervisor. All items of both scales are scored on a six-point Likert scale ranging from (1) totally disagree to (6) totally agree. The scale variables are constructed as the mean scores of the items.

#### **Psychosocial work characteristics**

The psychosocial work characteristics represent the dimensions of the DCS-model (Karasek, 1979; Karasek et al., 1998), with 4 items indicating job demands, 8 items indicating job control and 2 items indicating social support from colleagues (see Chapter 2). The Cronbach's alpha for the demand and control scale were 0.63 to 0.73, respectively. Mean scores are calculated for each scale.

#### **Control variables**

We controlled for age (in years), gender (0=women; 1=men) and project phase of the doctorate (0= executing phase; 1= planning or finishing phase). Additionally we control for personal, resources-related and work organization-related factors interfering with research. For this end we compute the number of times doctoral students indicate whether a factor interfered with their research or not (0=no interference; 1=interference). Five personal factors were considered: chronic disease, pregnancy and parenthood, marriage/relationship, job of the partner and combination of work and private life. There are seven work organization-related factors: lack of personal research skills, subject is

too specific, change of supervisor or of subject, lack of research plan, lack of guidance and lack of time. The five resources-related factors are: lack of means to conduct research, inadequate access to or availability of tools and documentation, hindering work climate, contracts with a duration that is too short and having to spend too much time on non-research activities.

### **6.2.3. Statistical analysis**

Structural equation modeling was applied to explore (LISREL 8.72; Jöreskog & Sörbom, 2004) the underlying structure of the relationships among supervisor's mentoring style, Ph.D. students' psychosocial working conditions and work-related well-being. Two models are estimated: a first model including only the main effects of mentoring style on the intermediate and outcome variables (Model 1), and a second model that adds interaction terms between authoritative and supportive mentoring styles (Model 2). The interaction effect was calculated as the product of the centered scores of the two variables. To judge the fit of both models, in addition to chi-square, we also consider the goodness-of-fit index (GFI), the normed fit index (NFI), the comparative fit index (CFI) and the root-mean square error of approximation (RMSEA). Both structural equation models had an acceptable fit.

## **6.3. Results**

### **6.3.1. Descriptives**

The sample is composed of 50.6% (N=955) male and 49.4% (N=932) female Ph.D. students. Their average age is 27.5 years (SD 4.4). In total, 21.1% (N=387) of the students are in the initial planning phase of their Ph.D. project, 57.6% (N=1059) are in the executing phase and 21.3% (N=392) are in the final finishing and reporting phase. Doctoral students in the natural sciences represent the largest group (26.9%, N=505), followed by students in the biomedical sciences (22.7%, N=436), the social sciences (18.1%, N=341), the applied sciences (18.1%, N=340) and the humanities (13.7%, N=257).

The mean score on the authoritative mentoring scale is 2.4 (SD 1.0) and 4.3 (SD 1.0) on the supportive mentoring scale. The mean job demand, job control and social support from colleagues are 1.1 (SD 0.5); 1.9 (SD 0.4) and 2.0 (SD 0.7), respectively. The mean scores for the well-being indicators are 4.9 (SD 1.0) for job satisfaction, 2.2 (SD 0.5) for pleasure at work and 1.0 (SD 0.6) for the need for recovery after work.

### **6.3.2. Mentoring styles, working conditions and well-being**

The results in Table 6.1 show that the work-related well-being of Ph.D. students is affected by the working conditions under which their doctoral project is being done. Job demands negatively affect work-related well-being while job control and co-worker support have a positive effect. From these three working conditions, job control has the strongest effect on student well-being. Job control and co-worker support are positively affected by a supportive mentoring style, and decrease when the supervisor is authoritative. As for the job demands, it is observed that Ph.D. students who experience an authoritative mentoring style from their supervisor, report higher job demands. Findings also show that students' work-related well-being is lower if they perceive their supervisor as authoritative and higher when the supervisor has a supportive mentoring style.

Work-related well-being and job demands are positively affected by the age of Ph.D. students whereas age negatively affects co-worker support. Male Ph.D. students report lower job demands compared to their female colleagues. All factors related with research interference, such as personal, resources-related and work organization-related problems have a positive effect on job demands. The work-related well-being is lower among students who experience personal and work organization-related problems, whereas work organization and resources-related problems have a negative effect on job control. Work organization-related factors also have a negative effect on co-worker support. Students in the planning phase of their doctoral project report higher co-worker support than students in the executing phase. Compared to students in the executing phase, students in the finishing phase report higher job demands and lower job control, co-worker support and work-related well-being.

The total, direct and indirect effects of both types of mentoring style on well-being are reported in Table 6.2. The results show that an authoritative mentoring style has a total negative effect on work-related well-being. This effect is not equally exerted directly (45%) and indirectly (55%). The indirect relation points out that the effect of an authoritative mentoring style is mediated by job demands, control and co-worker support. With regard to the effects of a supportive mentoring style, positive effects on well-being are found that run more indirectly (59%) than directly (41%). As shown in Table 6.1, job control and to a lesser extent co-worker support form important mediators in this relationship. When comparing the size of the effects of both mentoring styles, it is observed that the negative effects on work-related well-being of an authoritative mentor are larger than the positive effects of having a supportive supervisor.

Table 6.1. Unstandardized and standardized coefficients for Model 1, including a Supportive Mentoring Style and an Authoritative Mentoring Style (MS).

b (p) $\beta$	Demand	Control	Support	Well-being
Demand				-0.094*** (-0.094)
Control				0.362*** (0.362)
Support				0.170*** (0.170)
Authorita- tive MS	0.134*** (0.130)	-0.221*** (-0.215)	-0.097*** (-0.094)	-0.089*** (-0.087)
Supportive MS		0.156*** (0.161)	0.107*** (0.111)	0.052* (0.054)
Age	0.018** (0.070)		-0.029*** (-0.115)	0.018** (0.072)
Gender	-0.103* (-0.052)			
Personal factors	0.118** (0.079)			-0.078 * (-0.052)
Work organ- ization fac- tors	0.053* (0.059)	-0.199*** (-0.222)	-0.190*** (-0.213)	-0.338*** (-0.379)
Resources- related fac- tors	0.250*** (0.240)	-0.063** (-0.061)		
Planning phase			0.131* (0.053)	
Finishing phase	0.213*** (0.087)	-0.164** (-0.067)	-0.144* (-0.059)	-0.165** (-0.068)

significance: \*:  $p < 0.050$ ; \*\*:  $p < 0.010$ ; \*\*\*:  $p < 0.001$

$\chi^2 = 394.51$ ,  $df = 81$ ,  $p < 0.001$ , GFI = 0.969, CFI = 0.950, RMSEA = 0.048 and NFI = 0.938.

Table 6.2. Unstandardized estimates of the direct, indirect and total effects of mentoring style (MS) on work-related well-being.

Well-being	Authoritative MS		Supportive MS	
	Effect	%	Effect	%
Total	-0.198		0.127	
Direct	-0.089	45%	0.052	41%
Indirect	-0.109	55%	0.075	59%

### 6.3.3. When authoritative and supportive mentoring styles interact

The combination of a supportive and an authoritative mentoring style has a negative effect on co-worker support and job control (see

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Table 6.3). The interaction between both types of mentoring style also has a negative effect on work-related well-being. Figure 6.1 shows the effect on well-being of the interaction between an authoritative and a supportive mentoring style. This figure shows that at low levels of an authoritative mentoring style (10th percentile), the work-related well-being of Ph.D. students increases with increasing levels of a supportive mentoring style. However, at high levels of an authoritative mentoring style (90th percentile), the positive effect of a supportive mentoring style on work-related well-being disappears and even turns negative.

*Table 6.3. Unstandardized and standardized coefficients for Model 2, including a Supportive Mentoring Style and an Authoritative Mentoring Style (MS) and the interaction between a Supportive and an Authoritative Mentoring Style (AMS\*SMS).*

b (p) β	Demand	Control	Support	Well-being
Demand				-0.089*** (-0.089)
Control				0.347*** (0.347)
Support				0.163*** (0.163)
Authorita- tive MS	0.134*** (0.130)	-0.279*** (-0.272)	-0.143*** (-0.139)	-0.128*** (-0.125)
Supportive MS		0.186*** (0.193)	0.130*** (0.135)	0.072** (0.075)
AMS*SMS		-0.134*** (-0.172)	-0.108*** (-0.139)	-0.079*** (-0.101)
Age	0.018** (0.072)		-0.026*** (-0.102)	0.018** (0.069)
Gender	-0.103* (-0.051)			
Personal factors	0.118** (0.078))			-0.081* (-0.053)
Work or- ganization factors	0.053* (0.059)	-0.167*** (-0.188)	-0.159*** (-0.178)	-0.328*** (-0.367)
Resources- related fac- tors	0.250*** (0.240)	-0.087*** (-0.083)	-0.065* (-0.063)	
Planning phase			0.153** (-0.061)	
Finishing phase	0.211*** (0.087)	-0.112* (-0.046)		-0.147** (-0.060)

significance: \*:  $p < 0.050$ ; \*\*:  $p < 0.010$ ; \*\*\*:  $p < 0.001$

$\chi^2 = 401.26$ ,  $df = 95$ ,  $p < 0.001$ , GFI = 0.971, CFI = 0.953, RMSEA = 0.043 and NFI = 0.940



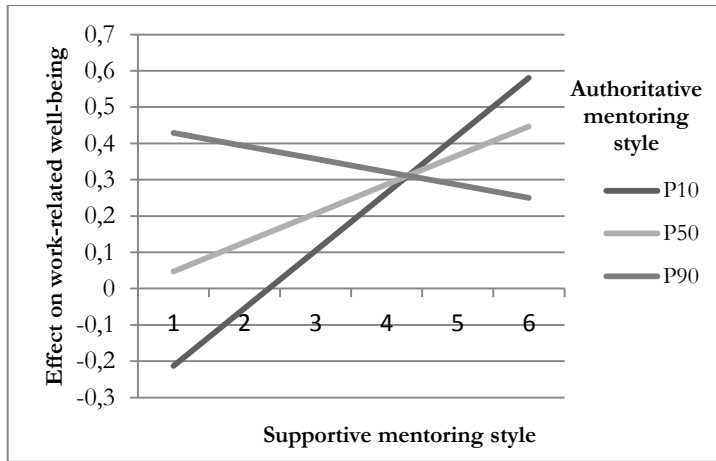


Figure 6.1. The effects of supportive mentoring style on the work-related well-being of Ph.D. students by a low (10<sup>th</sup> percentile), a median (50<sup>th</sup> percentile) and a high (90<sup>th</sup> percentile) authoritative mentoring style (AMS).

## 6.4. Discussion

In this study, the influence of the mentoring style of the Ph.D. supervisor on the work-related well-being of 1887 Ph.D. students from four participating Flemish universities was investigated, by taking into account the extent of a possible mediating effect of students' psychosocial working conditions. All three psychosocial working conditions had an effect on the work-related well-being of doctoral students. In line with previous research (Hausser et al., 2010; van der Doef & Maes, 1998), we found that job control and co-worker support had positive effects on students' work related well-being, while job demands had a negative effect.

The results revealed that supportive and authoritative mentoring styles had counterbalancing effects on Ph.D. students' psychosocial working conditions and work-related well-being. The more doctoral students perceived their supervisor as supportive, the higher their perceived job control and co-worker support. This suggests that supportive supervisors are better able to create a work climate in which Ph.D. students can rely on peers for advice, feed-back and support. In contrast, the more doctoral students perceived their supervisor as authoritative and directive, the higher they perceived their job demands, and the lower their job control and co-worker support. An authoritative mentoring style leads to a situation of high job demands, low decision latitude and low social support from co-workers. This adverse situation often results in higher stress levels and subsequently to poor health and well-being, according to the DCS-model (Karasek et al., 1998). In addition, the in-

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teraction between authoritative and supportive mentoring styles was inversely related to students' job control and co-worker support.

The results also suggest that unlike an authoritative mentoring style, a supportive mentoring style had a positive but smaller direct effect on the work-related well-being of Ph.D. students. However, when both types of mentoring style were combined, the positive effect of the supervisor's support on well-being disappeared when the supervisor is also authoritative and directive. These findings indicate that Ph.D. students who experience their supervisor as both highly supportive and highly authoritative lose the benefits of having a supportive supervisor. The high demands imposed by a directive, authoritative supervisor in combination with the social support Ph.D. students receive from the same supervisor may lead to conflicting cognitions and mixed emotions about the supervisor, which in turn may negatively affect their well-being. This is in line with the within-domain stress-buffering hypothesis proposing that social support from the same source as the stressor, in this case the (authoritative) supervisor, strengthens the negative effects of this stressor, whereas social support from a different source than the stressor (i.e. co-workers, friends, family) buffers these negative effects (cross-domain stress buffering) (Lepore, 1992; Major et al., 1997). Although, a supportive mentoring style has a positive effect on the social support Ph.D. students receive from their co-workers, co-worker support did not buffer the negative effect of an authoritative mentoring style on students' work related well-being.

The effects of mentoring style on well-being are both direct and indirect through the psychosocial work characteristics (job demands, control and co-worker support). These findings are in line with the results obtained by Nielsen et al. (2008a), who found that the effect of transformational leadership on employees' psychological well-being was to a large extent mediated by work characteristics such as increased role clarity, meaningfulness, and opportunities for development in a sample of Danish health care workers.

When interpreting the results of the present study, some limitations need to be acknowledged. A notable limitation is that our study is based on a cross-sectional design, which does not allow making statements about causal (reversed and reciprocal) relationships. However, statistical techniques such as structural equation modelling may provide an indication of the causal direction of particular pathways in cross-sectional research. Another possible weakness is the use of self-reported measures for the exogenous and endogenous variables, through which a common method bias might have played a role. Although, Spector (2006) stated that these influences are not as high as could be expected. Another important issue relates to the generalizability of our findings to doctoral educational systems in other countries given that social roles and the supervisor-student relationship may be partially culturally determined. As both the Ph.D. student and the supervisor have a double status in the

Flemish system, as a student and worker, and as an academic and administrative supervisor respectively, this also might have implications for the observed mechanisms and Ph.D. students' exposure to mentoring style, psychosocial working conditions and well-being.

Despite these limitations, our results stress the importance of mentoring style of the supervisor and the psychosocial working conditions for student well-being. Promoting well-being is important given that a reduction in well-being has been found to be a strong predictor of voluntary turnover among employees (Griffeth et al., 2000). Based on our results, we could expect that Ph.D. students prefer a low directing/high supportive leadership style. However, the success of changing Ph.D. supervisors' mentoring style for enhancing student well-being might be questionable as leaders may not necessarily adapt their style to the needs and expectations of their subordinates (Hur, 2008). One way to improve Ph.D. students' work-related well-being is by adapting the working conditions at the organizational-level. Our findings suggest that the job control Ph.D. students experience and to a lesser extent co-workers support, strongly influence their work-related well-being. Co-worker support has also been found to be a particularly important factor for the study and research progress of doctoral students (Martinsuo & Turkulainen, 2011). Measures to change Ph.D. students' working conditions on a university level can come, for example from organizing a doctoral training program, including specialist and transferable skills courses (i.e. communication skills, personal effectiveness and management skills). In Flanders, in each university, a flexible doctoral training program for Ph.D. students in all scientific fields is offered by the Doctoral Schools (VRWB, 2002). By taking courses from this program students meet and interact with Ph.D. candidates from other departments and disciplines. Sharing their experiences may enhance their social support. Such courses also allow doctoral candidates to acquire and develop a broader range of competencies that are useful for their doctoral project but also for their future career. As Ph.D. students gain more skills, knowledge and experience, this will enable them to work more autonomously through which they may rely less on their supervisor. This is in line with SLT's core principle that highly mature employees need less supervisory involvement (Hersey et al., 2001).

Future research addressing the mentoring style-well-being relationship should take into account demographic characteristics of both Ph.D. supervisors and students for instance to investigate whether the mentoring style of male and female supervisors differently affect male and female student well-being. It would also be valuable to pay more attention to the work context when investigating well-being as it influences work characteristics and may differ according to the academic culture of the diverse scientific discipline (Stubb et al., 2011).

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## **Chapter 7. THE WORK-RELATED WELL-BEING OF MALE AND FEMALE PH.D. STUDENTS: HOW IMPORTANT IS THE LEADERSHIP STYLE OF THEIR SUPERVISOR?**

Derycke, H., Draulans, V., Levecque, K., & Van Rossem, R. The work-related well-being of male and female Ph.D. students: how important is the leadership style of their supervisor? *Submitted*

**The work-related well-being of male and female Ph.D. students:  
how important is the leadership style of their supervisor?**

***Abstract***

This study examines whether the leadership style of Ph.D. supervisors influences the work-related well-being of male and female Ph.D. students differently by taking into account students' psychosocial working conditions as possible mediating factors. These conditions include job demands, job control and co-worker support. Multi-group structural equation modeling was applied on a sample of 955 male and 932 female Ph.D. students from four Flemish universities. For both men and women, the association between leadership style of the supervisor and well-being was partially mediated by one's psychosocial working conditions. A supportive leadership style has a positive effect on job control and well-being, while a directive leadership style leads to increasing job demands and negatively influences job control, co-worker support and well-being. These findings suggest that a supportive and a directive leadership style have counterbalancing effects on well-being. Analyses show no significant differences in effects for men and women, and across disciplines.

## 7.1. Introduction

Over the past few decades the need for highly skilled workers has increased sharply in many OECD countries. These countries all experienced a substantial increase in the number of doctorate holders (Cyranoski, Gilbert, Ledford, Nayar, & Yahia, 2011). In Europe, in 2009 most Ph.D.'s were granted in Germany (25,527), the United Kingdom (17,651) and France (11,941), whereas in Belgium 1,902 doctorate holders graduated (Vandeveldt & te Kaat, 2012). The number of doctorate holders per capita is highest in Germany (0.311) and the United Kingdom (0.287), followed by the Netherlands (0.200) and France (0.186). The number of doctorate holders per 1000 inhabitants is smaller in Belgium (0.177) and differs between Flanders (0.191) and Wallonia (0.156), the Dutch and French speaking part of Belgium, respectively. For Wallonia the number of Ph.D.'s who graduated between 2002 and 2009 rose from 600 to 675. While in Flanders, a more substantial increase, that is remarkably higher than in other EU countries (151%), is observed: from 811 Ph.D.'s in the academic year 2001-2002 to 1228 in 2008-2009 (Vandeveldt & te Kaat, 2012). This sharp increase of Ph.D.'s was made possible by an enormous investment by the government to provide the necessary funding that allows a rapidly increasing number of Ph.D. projects (Visser, Luwel, & Moed, 2007). In Flanders, the number of academic and scientific staff (non-faculty in FTE) rose from 3215.2 in 1990 to 14161.3 in 2012, the overwhelming majority of them being junior, i.e., pre-doctoral researchers (VLIR, 2012). This paper focuses on the situation of Ph.D. students in Flanders. The annual enrolment of junior researchers at the Flemish universities has almost doubled, from 881 in 1990-1991 to 1654 in 2010-2011. While in the academic year 2002-2003 still more men were enrolled as Ph.D. candidates, respectively, 52.6% males vs. 47.3% females, by the academic year 2010-2011 the intake of male and female Ph.D. students has almost reached an equilibrium with 50.7% men and 49.3% women (ECOOM, 2013). Nevertheless, not all Ph.D. students are equally successful; many of them never attain their doctoral degree or only do so after a long time. Of the cohort that started as junior researchers at a Flemish university in 2002-2003, 54.6% obtained their Ph.D. within a time period up to eight years, which was a substantial improvement over the cohort starting in 1990-1991, of which only 36.5% did so (ECOOM, 2013; Groenvynck et al., 2011). Clear gender differences can be observed regarding the success rates of doctoral candidates at Flemish universities. Where among the cohort 2002-2003 57.9% of the men completed their doctorate within eight years, only 44.0% of women did (ECOOM, 2013). Based on aggregated data of 18.600 Ph.D. students who were enrolled in the period 1991-2002 at one of the Flemish universities, Visser, Luwel & Moed (2007) found that the success rates differed between male and female Ph.D. students, with men being slightly more successful in obtaining a doctorate even after con-

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trolling for the funding source, the discipline, the grade of the master degree, and the type of appointment.

Several studies have suggested that female doctoral students may face greater difficulties during their Ph.D. period than men and are less satisfied with their overall study experience (Kurtz-Costes, Helmke, & Ulku-Steiner, 2006; Moyer, Salovey, & Casey-Cannon, 1999; Seagram, Gould, & Pyke, 1998; Ulku-Steiner, Kurtz-Costes, & Kinlaw, 2000). Female Ph.D. students reported higher levels of work stress and were more likely to be part-time students and to have family responsibilities that interfere with their activities as a doctoral student (Kurtz-Costes et al., 2006; Moyer et al., 1999; Ulku-Steiner et al., 2000). Despite the growing number of female faculty and doctoral students, academia is still a male-dominated work environment. In Flanders, in the academic year 2011-2012, men accounted for 60.9% of the post-doc positions (in FTE) and for 77.7% of the appointed faculty positions (in FTE) (VLIR, 2012). The representation of women was even smaller at the highest academic ranks: while 35.8% of the assistant professors were female, only 11.3% of the senior full professors were women (VLIR, 2012). Due to the prevailing academic culture, emphasizing traditional values such as productivity, competition and self-promotion and the requirement of a full-time dedication to the academic work, women in academia are frequently confronted with stereotypical images on the part of faculty with traditional attitudes toward gender roles (Acker, 2008; Benschop & Brouns, 2003; Van den Brink, 2009). Often faculty have higher expectations for men and believe that men are more devoted to their academic work than women because the latter are assumed to face more constraints due to family responsibilities (Benschop & Brouns, 2003; Kurtz-Costes et al., 2006; Van den Brink, 2009). Women, especially in higher academic positions, feel they have to prove themselves more than men in order to get equally acknowledged for their achievements (Van den Brink, 2009).

At the level of doctoral students, the Ph.D. supervisor can play an important role in facilitating the Ph.D. process for both men and women. Supervisors can stimulate Ph.D. students' professional and personal development by offering career mentoring and psychosocial support (Paglis, Green, & Bauer, 2006). The overall supportiveness of the supervisor, including less traditional attitudes towards balancing academic and personal lives, was found to have a beneficial effect on both male and female doctoral students' self-perceived stress levels and career commitment (Kurtz-Costes et al., 2006). A Ph.D. supervisor can help students to manage their work-life balance, but can instead also increase the tension between academic and private life depending upon his/her attitudes and concern for students' well-being (Kurtz-Costes et al., 2006). Previous research has largely ignored the well-being of doctoral students as an important contributing factor to their success (Stubbs, Pyhalto, & Lonka, 2011), although, the well-being of doctoral candidates is an important criterion on its own given that well-being and especially job satisfaction are typically related to employees' job performance and voluntary turno-

ver (Griffeth, Hom, & Gaertner, 2000; Harrison, Newman, & Roth, 2006; Wright & Bonett, 2007).

In this study, we address the well-being of Ph.D. students in Flanders. In the Flemish system, almost all doctoral students or junior researchers are university employees. They receive a salary and are protected by the Belgian labor legislation (Visser et al., 2007). This double status as both student and employee has implications for the relationship with their supervisor. The supervising faculty member is not only their academic supervisor or mentor, but their administrative one as well. We assess to what extent students' well-being is influenced by the leadership style of their main Ph.D. supervisor and seek to investigate whether the leadership style of the supervisor affects the well-being of male and female Ph.D. students differently.

## **7.2. Theoretical framework**

### **7.2.1. The leadership style of the Ph.D. supervisor**

Leadership style refers to relatively stable patterns of behavior that leaders employ to influence the behaviors of subordinates (Eagly & Johannesen-Schmidt, 2001; Skakon, Nielsen, Borg, & Guzman, 2010). Ph.D. supervisors are expected to provide the time, expertise and support to help and stimulate doctoral students to gain knowledge and develop research skills and attitudes, needed not only to successfully complete their doctoral project, but also for a future successful career as researcher (Mainhard, van der Rijst, van Tartwijk, & Wubbels, 2009). Meanwhile supervisors also play an important role in the assessment of the quality of the research and the work of the doctoral student (Mainhard et al., 2009). In order to achieve the objective of a successful Ph.D. completion, the Ph.D. supervisor can adopt different leadership styles like task-oriented style and relationship-oriented style. Both types of leadership style correspond to the main styles of classic leadership research (Stodgill & Coors, 1957). Task-oriented leadership style is labeled as 'initiating structure' and is characterized by a strong focus on achieving goals by giving employees clear rules and instructions regarding work activities, by maintaining standards for performance and by determining the consequences of goal attainment (Eagly & Johannesen-Schmidt, 2001; Judge, Piccolo, & Ilies, 2004). A Ph.D. supervisor can be directive for example, by providing clear direction and by continuously monitoring the Ph.D. students' progress through spelling out their duties and responsibilities (directive leadership style). A relationship-oriented leadership style is labeled as consideration and is characterized by behaviors such as helping subordinates by acting in a facilitative and supportive manner, being friendly and available for subordinates and involving employees in decisions (Eagly & Johannesen-Schmidt, 2001). A Ph.D. supervisor may be supportive and encouraging for example by discussing the research of his/her Ph.D. students on a regular basis, by helping them with the preparation of publications and by introducing students in

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his/her personal network (supportive leadership style), all in close consultation with his/her Ph.D. students. Because these directive and supportive leadership styles are relatively independent leadership styles, leaders may combine both styles to varying degrees (Yammarino, Dionne, Chun, & Dansereau, 2005).

Various types of leadership style have generally been found to influence employees' stress and well-being (Skakon et al., 2010). However, previous research has mainly focused on the association between leadership style and well-being (Kuoppala, Lamminpaa, Liira, & Vainio, 2008) without explaining how leadership style influences well-being and thereby neglecting that work characteristics may affect this relationship. Only a couple of studies on transformational leadership indicated that employees' perceptions of work characteristics such as role clarity, meaningfulness of work and opportunities for development, did mediate the relationship between leadership style and employee well-being and job satisfaction (Nielsen, Randall, Yarker, & Brenner, 2008; Nielsen, Yarker, Brenner, Randall, & Borg, 2008).

### **7.2.2. Psychosocial working conditions and well-being**

Abundant literature shows that working conditions contribute to the well-being and job-satisfaction of workers (Hausser, Mojzisch, Niesel, & Schulz-Hardt, 2010; van der Doef & Maes, 1998; for Flanders: Vanroelen, Levecque, & Louckx, 2009). An influential model here is the job Demand-Control-Support (DCS) model (Johnson & Hall, 1988; Karasek, 1979; Karasek et al., 1998). This job strain model distinguishes three essential characteristics of the work environment: a) job demands, b) job control and c) social support (Karasek et al., 1998). Job demands are defined as the psychological stressors in the work environment (e.g. workload, pace of work). Job control or decision latitude to cope with these demands refers to the extent employees are capable of controlling their job task. Job control consists of both skill discretion and decision authority. Skill discretion describes the level of creativity and variety that is required for the job and decision authority refers to the extent of decision making authority employees have to perform their tasks. Social support refers to the emotional support employees get from their supervisor and co-workers. According to the DCS model, psychosocial job strain results from work situations characterized by high job demands in combination with low job control and low co-worker and supervisor support. These situations are the most harmful for employees' health and well-being (Karasek et al., 1998). The DC(S) model has been applied in numerous studies to a broad array of health and well-being related outcomes and has been tested among various contexts (De Lange, Taris, Kompier, Houtman, & Bongers, 2003; Hausser, Mojzisch, Niesel, & Schulz-Hardt, 2010; Karasek et al., 1998; van der Doef & Maes, 1998), but only few studies have investigated this model in an academic context, (e.g. Chambel & Curral, 2005; Cotton, Dollard, & de Jonge, 2002). How-

ever, these studies focused on university undergraduates and not on Ph.D. students.

The working conditions of doctoral students can be described using the three dimensions of the DCS model. Ph.D. students are supposed to obtain their doctorate in a timely manner before their stipend or funds run out. This causes high workloads and pressure to finish in time (Hakala, 2009; Moyer et al., 1999), but such high demands might be compensated by high decision latitude. Being able to make their own decisions in terms of learning, and developing special abilities, allows doctoral students to grow in their role as researcher and to conduct research on a more independent basis (Hakala, 2009). However, as the student's supervisor is often the main responsible for funding the student's project and accounting to funding agencies, doctoral researchers often experience limited autonomy regarding their research. This lower decision latitude might be combined by high job demands imposed by the supervisor. The DCS-model suggests that social support received by co-workers and/or supervisor might buffer the stressing effects of high demands and low controls. Therefore, we can expect that students lacking such social support may get discouraged with their research (Martinsuo & Turkulainen, 2011).

### **7.2.3. Leadership style and well-being of male and female Ph.D. students**

As men and women may have other preferences concerning leadership styles, the effects of a supportive and directive leadership style may differ for male and female Ph.D. students. A study by Vecchio & Boatwright (2002) showed that in a sample of 1137 employees, women expressed a greater preference for leaders' socio-emotional relationship behavior than men, whereas no significant difference in preference for leaders' directive tasks behavior was observed. Similar findings were obtained by Bellou (2011), indicating that compared to their male co-workers, female employees expect their leaders to be more people-oriented. Consequently, a supportive leadership style might be more beneficial for female Ph.D. students. A meta-analytic study (Judge et al., 2004) showed that a relationship-oriented leadership style is more strongly related to employees' job satisfaction, whereas a task-oriented leadership style is slightly more strongly related to leader performance (i.e. group-organization performance). It was also suggested that directive leaders may give employees the feeling that they have no say in how rules and procedures are established regarding their work activities (Judge et al., 2004), which in turn may reduce their job control and well-being. In this view, it could be expected that a supportive leadership style will have a positive effect on Ph.D. students' well-being, while a directive leadership style will have opposite effects.

Previous research has shown that when a group leader adopted medium to high levels of consideration (i.e. relationship-oriented leader-

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ship style) and low levels of structure (i.e. directive leadership behavior) employee turnover and grievances were lower. Moreover considerate leaders could increase structure (i.e. directive leadership behavior) with little or no negative consequences in terms of grievances and employee turnover, whereas this is not the case for less considerate leaders (Fleishman, 1998; Fleishman & Harris, 1962). However, it can be questioned whether the combination of both leadership styles will have a similar effect on students' work-related well-being. When a supervisor acts both supportive and directive, employees may experience conflicting cognitions and mixed emotions about the supervisor. According to the *within-domain stress-buffering* hypothesis, support from the same source as the stressor, in this case the directive supervisor, strengthens the negative effects of this stressor, whereas social support from a different source than the stressor (i.e. co-workers, friends, family) buffers these negative effects (*cross-domain stress-buffering*) (Lepore, 1992; Major, Zubeck, Cooper, Cozzarelli, & Richards, 1997). So, it could be assumed that a supervisor who is perceived as both supportive and directive will have a negatively effect on Ph.D. students' work-related well-being. The sources of social support may differ between men and women (Führer & Stansfeld, 2002). Men may get more social support from their supervisor and colleagues, whereas women seek support more outside the work environment (Stansfeld & Candy, 2006).

Leadership style, however, does not only depend on the individual characteristics of a supervisor but also on job characteristics, organizational design, and organizational culture (van Emmerik, Wendt, & Euwema, 2010). The organizational culture in academia differs across scientific disciplines (Stubbs et al., 2011; Visser et al., 2007). Different scientific cultures and accordingly other norms and practices, for instance with regard to funding resources and publishing strategies, may influence the supervisor-student relationship. In disciplines like medicine, science, engineering and technology, it is common that doctoral students join a research group where team work, also in publishing policies, is dominant and the topic of the dissertation is often proposed by the supervisor (Noy & Ray, 2012). In other disciplines, like the social sciences and humanities, students are more likely to work on an individual basis and their personal interest is more often considered when selecting a research topic or during the course of the Ph.D. project (Hakala, 2009; Visser et al., 2007). The relationship with the supervisor might be more personal, because often there is no research team to provide additional support (Hakala, 2009). So differences in organizational culture between disciplines may shape doctoral students' perceptions of their supervisor's leadership style and psychosocial working conditions.

In view of the limited research on Ph.D. supervisor's leadership styles and Ph.D. student's well-being, the present study addresses following research questions:



- Controlling for psychosocial working conditions, is a Ph.D. student's work-related well-being influenced by a supportive leadership style, a directive leadership style, and the interaction between both styles?
- Is the effect of leadership style on students' work-related well-being different for male and female students and differ these effects between scientific disciplines?

### 7.3. *Methods*

#### 7.3.1. Study sample

The present study is based on the Survey of Junior Researchers 2008 which was organized among the total population of junior researchers in four of the five Flemish universities (Belgium)<sup>1</sup>. Among other topics, respondents were asked about their education and employment history, their research and well-being, and their appreciation of their supervisor's leadership style on two leadership dimensions. From the 5,976 junior researchers who were invited to fill out the online survey between March and December 2008, 2,599 researchers completed the questionnaire (44%). Our study sample consists of 1887 junior researchers who were officially enrolled in a Ph.D. program. Researchers who already defended their Ph.D., who had quit their Ph.D. program or were not enrolled in a Ph.D. program yet, or those who did not know if they wanted to start a Ph.D. project, were excluded from the study.

#### 7.3.2. Variables of interest

##### Work-related well-being

Work-related well-being is approached as a latent variable, composed of three aspects of well-being: job satisfaction, pleasure at work and need for recovery after work. The standardized factor loadings of these three aspects for men are: 0.75 for job satisfaction, 0.76 for pleasure at work and -0.34 for need for recovery after work, for women we observed: 0.79 for job satisfaction, 0.80 for pleasure at work and -0.33 for need for recovery<sup>2</sup>. Job satisfaction is represented by a single question: 'To which extent are you in general satisfied with your current job?'. Possible answers range from (1) very dissatisfied to (6) very satisfied. Previous research suggested that single-item measures can be acceptable indicators of satisfaction (Wanous et al., 1997). Pleasure at work is measured by the mean score on 5 items: 'I do my work because I have to, and

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1 Ghent University: N=791; the Vrije Universiteit Brussel: N=505; University of Antwerp: N=487; Hasselt University: N=104.

<sup>2</sup> Equality constraints between male and female samples were imposed for the unstandardized loadings.

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that says it all', 'Mostly, I am pleased to start my day's research', 'I still find my work stimulating, each and every day', 'I have to continually overcome my resistance in order to do my work', 'I enjoy my work'. Possible answers range from (0) never to (3) always. The Cronbach's alpha for the pleasure at work scale was 0.83. The degree of need for recovery after work was also assessed as the mean score of 5 items: 'I find it difficult to relax at the end of a working day', 'Because of my job, at the end of the working day I feel rather exhausted', 'I find it difficult to concentrate in my free time after work', 'Generally, I need more than an hour before I feel completely recuperated after work', 'A feeling of tiredness prevents me from doing my work as well as I normally would during the last part of the working day'. Again, possible answers range from (0) never to (3) always. The Cronbach's alpha for this scale was 0.83.

### **Leadership style of the supervisor**

The leadership style of the supervisor is assessed by two scales, measuring how strongly Ph.D. students perceive their supervisor to be directive and supportive. Ph.D. students are asked to indicate how strongly they agree with statements concerning the leadership style of their main supervisor. The directive leadership style scale comprises of 6 items: 'Determines the course of my project in too much detail', 'Forces his/her opinion on me', 'His/her word is law', 'Gives me enough freedom concerning the content of my project', 'Always thinks that he/she knows better', and 'Gives me enough freedom concerning the methodology of my research'. The supportive leadership scale measuring how encouraging Ph.D. students find their supervisor contains 11 items. Examples of these items are 'Is generally a good supervisor', 'Makes relevant suggestions', 'Advises me about the development of my project', 'Knows how to enthuse me', 'Is critical in a constructive way regarding my work', 'Regularly discusses my research with me' and 'Helps me with the preparation of publications'. All items of both scales are scored on a six-point Likert-scale ranging from (1) totally disagree to (6) totally agree. The Cronbach's alpha for both scales were 0.86 and 0.94, respectively. The scale variables are constructed as the mean scores of the items.

### **Psychosocial work characteristics**

The psychosocial work characteristics represent the dimensions of the DCS-model (Karasek, 1979; Karasek et al., 1998). The demand scale contains 4 items: 'Do you have to work extra hard in order to complete something?', 'Do you work under time pressure?', 'Do you have to hurry?' and 'Do you receive contradictory instructions?'. Job control consists of 8 items, such as 'Does your work make sufficient demands on all your skills and capacities?', 'Do you learn new things in your work?', 'Does your work give you the feeling that you can achieve something?', 'Can you participate in decisions affecting issues related to your work?' and 'Can you consult satisfactorily with your supervisor about your work?'. Co-worker support comprises of 2 items: 'In your work, do you feel appreciated by your colleagues?' and 'If necessary can you ask your col-

leagues for help?'. The Cronbach's alpha for the demand and control scale were 0.63 to 0.73, respectively. Mean scores are calculated for each scale.

### Control variables

We controlled for age of the Ph.D. student (in years), the project phase of the doctorate (0= executing phase; 1= planning or finishing phase). We also controlled for personal, resources- related and work organization-related factors interfering with research. For this end we computed the number of times doctoral students indicated whether a factor interfered with their research or not (0= no interference; 1=interference). Five personal factors were considered: chronic disease, pregnancy and parenthood, marriage/relationship, job of the partner and combination of work and private life. There are seven work organization-related factors: lack of personal research skills, subject is too specific, change of supervisor or of subject, lack of research plan, lack of guidance and lack of time. The five resources-related factors are: lack of means to conduct research, inadequate access to or availability of tools and documentation, hindering work climate, contracts with a duration that is too short and having to spend too much time on non-research activities.

### 7.3.3. Statistical analysis

To assess whether the leadership style of the supervisor, the psychosocial working conditions and well-being indicators differed between male and female Ph.D. students and between scientific disciplines, independent sample *t*-test, chi-square tests and a two-way full factorial analysis of variance (ANOVA) were performed. Multi-group structural equation modeling was applied to explore the underlying structure of the relationships among supervisor's leadership style, Ph.D. students' psychosocial working conditions and work-related well-being (LISREL 8.72; Jöreskog & Sörbom, 2004). First, two models are estimated for male and female Ph.D. students: a first model including only the main effects of leadership style on the intermediate and outcome variables, and a second model that adds interaction terms between directive and supportive leadership styles. The interaction effect was calculated as the product of the centered scores of the two variables. To judge the fit of both models, in addition to chi-square, we also consider the goodness-of-fit index (GFI), the normed fit index (NFI), the comparative fit index (CFI) and the root-mean square error of approximation (RMSEA). Both structural equation models had an acceptable fit.

Next, multi-group analyses were performed, estimating the interaction model, for the six groups that result from combining gender and scientific discipline: male Ph.D. students in (1) sciences, engineering and technology (2) in social sciences and humanities, (3) in biomedical sciences, and female Ph.D. students in (4) sciences, engineering and technology, (5) social sciences and humanities, and (6) biomedical sciences.

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**7.4. Results**

**7.4.1. Descriptives**

The sample consists of 50.6% (N=955) male and 49.4% (N=932) female Ph.D. students. The average age is 27.5 years (SD 4.4), while about 4 in 5 are younger than 30. Only 13.7% (N=257) has children. The number of children does not significantly differ between males (M=1.67, SD=0.93) and females (M=1.59, SD=0.81,  $t(255)=-0.740$ ,  $p=ns$ ). 21.1% (N=387) of the students are in the initial planning phase of their Ph.D. project, 57.6% (N=1059) are in the executing phase and 21.3% (N=392) are in the final finishing and reporting phase. The number of men and women in the three phases does not differ significantly ( $\chi^2=2.922$ ,  $df=2$ ,  $ns$ ). Doctoral students in science, engineering and technology (SET) form the largest group (45.0%, N=845), followed by students in the social sciences and humanities (SSH) (31.8%, N=598), and biomedical sciences (BMS) (23.2%, N=436).

Gender differences exist between scientific disciplines ( $\chi^2=102.05$ ,  $df=2$ ,  $p< 0.001$ ): men form the majority in SET (63.0%), whereas women are more present in BMS (64.9%). In SSH, the gender distribution is more equal: 55.4% women and 44.6% men. As for well-being, no significant gender differences are found for job satisfaction and pleasure at work, although women report a higher need for recovery after work. The extent to which Ph.D. students perceived their supervisor as directive and/ or supportive was comparable for both men and women. The same applies to the psychosocial working conditions, the personal, work organizational and resources-related factors that interfere with research (see Table 7.1).

A two-way full factorial ANOVA including gender, discipline and the interaction between both shows that there is only a main effect of discipline on leadership style and students' psychosocial working conditions but no main effect of gender nor a significant interaction effect. This means that there are significant differences with regard to leadership style and working conditions between disciplines but not between male and female Ph.D. students of the same discipline. Doctoral students from the BMS and SET perceive their supervisor as significantly more directive and less supportive than their counterparts in SSH. Ph.D. students from the SSH and BMS report significantly higher job demands than those in SET. Job control is significantly higher for students in the SSH compared to their colleagues in the BMS and SET. Students in the SSH report also higher co-worker support in comparison with students in SET (see Table 7.2).

*Table 7.1. Description of the observed variables for the total sample and for men and women separately.*

	Range	Total	Mean (SD)		t
			Women	Men	

Directive LS	1-6	2.43 (0.96)	2.42 (0.92)	2.44 (0.98)	-0.59
Supportive LS	1-6	4.30 (1.05)	4.28 (1.04)	4.32 (1.06)	-0.71
Social support col- leagues	0-3	2.05 (0.68)	2.07 (0.69)	2.02 (0.67)	1.52
Demands	0-3	1.13 (0.45)	1.15 (0.45)	1.12 (0.45)	1.23
Control	0-3	1.90 (0.44)	1.89 (0.43)	1.91 (0.45)	-0.62
Personal factors interfering with research	0-5	0.32 (0.64)	0.34 (0.65)	0.30 (0.63)	1.55
Work organization factors interfering with research	0-7	0.75 (1.11)	0.76 (1.09)	0.74 (1.13)	0.40
Resources-related factors interfering with research	0-5	0.73 (0.94)	0.70 (0.95)	0.76 (0.94)	-1.33
Job satisfaction	0-3	4.90 (0.92)	4.90 (0.88)	4.90 (0.96)	-0.18
Pleasure at work	0-3	2.20 (0.51)	2.19 (0.50)	2.20 (0.52)	-0.63
Need for recovery	0-3	0.96 (0.59)	0.99 (0.59)	0.92 (0.59)	2.24*

\* $p < 0.05$ ; LS = Leadership style

The results in Table 7.3 show that job control and co-worker support have a positive impact on both male and female Ph.D. students' well-being, while job demands negatively affect men's well-being. A supportive leadership style has a positive effect on job control for both men and women and on co-worker support for men only. Job control and co-worker support decrease and job demands increase for both male and female doctoral students when their supervisor is directive. Both male and female Ph.D. students report higher work-related well-being in case of a supportive leadership style, whereas directive leaders trigger the opposite effect.

For both men and women, well-being and job demands are positively affected by their age, whereas age negatively affects co-worker support. All factors related with research interference, such as personal, resources-related and work organization-related problems have a positive effect on job demands. Well-being is lower among students who experience personal and work organization-related problems. The more work organization and resources-related problems men and women experience, the lower their job control and co-worker support. Male students in the planning phase of their doctoral project report higher co-worker support than students in the executing phase. Compared to students in the executing phase, male and female students in the finishing phase

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report higher job demands, lower job control, and work-related well-being, women also reported lower co-worker support.

*Table 7.2. Mean scores of reported leadership styles and psychosocial working conditions for men and women across science disciplines.*

	Mean (SD)				
	SET	SSH	BMS	F	$\eta^2$
Directive LS	2.51 (0.97)	2.21 (0.91)	2.56 (0.92)	21.435**	.024
Supportive LS	4.21 (1.08)	4.49 (0.99)	4.21 (1.03)	13.967***	.016
Social support colleagues	2.02 (0.68)	2.11 (0.67)	2.01 (0.69)	3.612*	.004
Demands	1.07 (0.45)	1.17 (0.43)	1.21 (0.48)	15.287***	.018
Control	1.87 (0.45)	1.96 (0.44)	1.86 (0.42)	7.785***	.010

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$

SET= Science, engineering and technology; SSH= Social sciences and humanities; BMS= Biomedical sciences; LS = Leadership style

Table 7.4 shows the total, direct and indirect effects of both types of leadership style on well-being. A directive leadership style both directly and indirectly affects well-being of men and women negatively. The indirect relation is mediated by job demands, control and social support from colleagues. With regard to a supportive leadership style we observe both direct and indirect positive effects. Note that the negative effects of a directive leadership style are considerably stronger than the positive effects of a supportive style, and the overall strength of the effects is quite similar for men and women. However, for women, job control, in particular, is an important mediator, while for men both job control and social support from colleagues matter. For both leadership styles, the indirect effects on well-being are larger than the direct effects.

Table 7.3. Unstandardized and standardized coefficients for Model 1, including Supportive and Directive Leadership style (LS).

b	Demand	Control	Support	Well-being
β				
Demand				-.224*** ( <b>-.148</b> )
Control				.570*** (.356; <b>.367</b> )
Support				.173*** (.168; .167)
Directive LS	.061*** (.126; <b>.136</b> )	-.098*** (-.213; <b>-.225</b> )	-.072*** (-.100; <b>-.110</b> )	-.063*** (-.086; <b>-.094</b> )
Supportive LS		.063*** (.148; <b>.150</b> )	.094*** (.150)	.035* (.052; <b>.054</b> )
Age	.008** (.066; <b>.079</b> )		-.016*** (-.086; <b>-.106</b> )	.012** (.060; <b>.073</b> )
Personal factors	.053** (.079; <b>.075</b> )			-.054* (-.052; <b>-.051</b> )
Work organiza- tion factors	.024* (.059; <b>.061</b> )	-.086*** (-.219; <b>-.222</b> )	-.130*** (-.213; <b>-.223</b> )	-.235*** (-.376; <b>-.391</b> )
Resources- related factors	.113*** (.239; <b>.239</b> )	-.041*** (-.091; <b>-.090</b> )	-.047** (-.067; <b>-.068</b> )	
Planning phase			.179*** (.109)	
Finishing phase	.094*** (.083; <b>.089</b> )	-.078*** (-.071; <b>-.075</b> )	-.144* (-.085)	-.113** (-.065; <b>-.070</b> )

Normal: women and men, *italics*: women, **bold**: men  
significance: \*: p<.050; \*\*: p<.010; \*\*\*: p<.001  
 $\chi^2=482.02$ , df=89, p < .001, GFI = .966, CFI =.945, RMSEA = .067 and NFI = .933.

Table 7.4. Unstandardized estimates of the direct, indirect and total effects of leadership style (LS) and psychosocial work characteristics on well-being.

Well-being	Directive LS				Supportive LS			
	Women		Men		Women		Men	
	Effect	%	Effect	%	Effect	%	Effect	%
Total	-0.132		-0.145		0.071		0.087	
Direct	-0.063	48	-0.063	44	0.035	50	0.035	40
Indirect	-0.068	52	-0.082	56	0.036	50	0.052	60

Interaction between dimensions of leadership style

Table 7.5 shows that for both men and women, the combination of supportive and directive leadership styles has a negative effect on co-worker support and job control, and, for men only, a positive one on job demands. For women, the interaction between both types of leadership styles also has a negative direct effect on work-related well-being. Figure 7.1 displays the interaction between directive and supportive leadership styles. This figure shows that when a supervisor is less directive, the

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work-related well-being of female Ph.D. students increases with increasing levels of a supportive supervision. In contrast, when a supervisor is very directive, the positive effect of higher levels of supportive supervision on well-being disappears and even turns negative.

*Table 7.5. Unstandardized and standardized coefficients for Model 2, including a Supportive Leadership style and an Directive Leadership style (LS) and the interaction between a Supportive and an Directive Leadership style (SLS\*DLS).*

b β	Demand	Control	Support	Well-being
Demand				-.222*** ( <b>-.146</b> )
Control				.560*** (.351; <b>.358</b> )
Support				.166*** (.162; .159)
Directive LS	.074*** (.153; <b>.165</b> )	-.121*** (-.262; <b>-.280</b> )	-.093*** (-.129; <b>-.143</b> )	-.077*** (-.104; <b>-.114</b> )
Supportive LS		.081*** (.190; <b>.195</b> )	.055*** (.083; <b>.192</b> )	.043* (.064; <b>.066</b> )
SLS*DLS	.040*** (.124)	-.057*** (-.155; <b>-.180</b> )	-.072*** (-.126; <b>.152</b> )	-.075*** (-.128)
Age	.009** (.067; <b>.082</b> )		-.017*** (-.088; <b>-.109</b> )	.012** (.059; <b>.072</b> )
Personal factors	.052** (.078; <b>.075</b> )			-.058* (-.057; <b>-.055</b> )
Work organization factors	.020* (.049; <b>.051</b> )	-.073*** (-.185; <b>-.189</b> )	-.107*** (-.175; <b>-.185</b> )	-.233*** (-.372; <b>-.387</b> )
Resources-related factors	.112*** (.236; <b>.238</b> )	-.038*** (-.084; <b>-.084</b> )	-.044* (-.062; <b>-.064</b> )	
Planning phase			.110** (.065; <b>.067</b> )	
Finishing phase	.089*** (.077; <b>.083</b> )	-.051* (-.047; <b>-.050</b> )		-.106** (-.060; <b>-.066</b> )

Normal: women and men, *italics*: women, **bold**: men

significance: \*:  $p < .050$ ; \*\*:  $p < .010$ ; \*\*\*:  $p < 0.001$

$\chi^2 = 448.90$ ,  $df = 97$ ,  $p < .001$ , GFI = .967, CFI = .946, RMSEA = .065 and NFI = .933

The additional multi-group analysis, estimating the interaction model, for the six combinations of gender and science discipline, revealed that the effects of leadership style on psychosocial working conditions and well-being differed only slightly between the science disciplines and are largely comparable to the results in Table 7.5. A directive leadership style has a positive effect on job demands and negatively affects job control, co-worker support and well-being for both men and women, regardless of the scientific discipline. Overall, a supportive leadership style reduces job demands and has a positive influence on job control. Men in SSH and SET, also reported higher co-worker support when having a supportive supervisor. Control and co-worker support decreases when both leadership styles were adopted by the supervisor. The in-



teraction between a directive and supportive leadership style positively affects the job demands of male students in SET, whereas it has a negative effect of the well-being of female students in SSH.

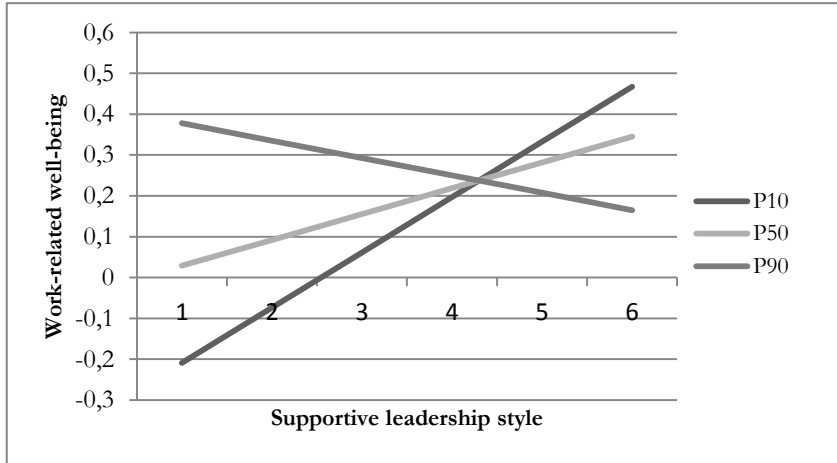


Figure 7.1. The effects of supportive leadership style on the work-related well-being of female Ph.D. students by a low (10<sup>th</sup> percentile), a median (50<sup>th</sup> percentile) and a high (90<sup>th</sup> percentile) directive leadership style.

## 7.5. Discussion and conclusion

Based on data for 1887 Ph.D. students from four Flemish universities, collected in 2008, we assessed whether the leadership style of the Ph.D. supervisor influences students' work-related well-being by taking into account psychosocial working conditions. We also assessed whether this effect differs for male and female Ph.D. students and whether there are differences across disciplines.

The results revealed that a supportive and a directive leadership style influence both Ph.D. students' well-being and psychosocial working conditions. The more doctoral students perceive their supervisor as directive, the more burdensome they perceive their job demands, and the lower their job control and co-worker support. A directive leadership style leads to high job demands, low decision latitude and low social support. According to the DCS model, these conditions cause higher stress levels, triggering poor health and well-being (Karasek et al., 1998). The more doctoral students perceive their supervisor as supportive, the higher their job control. For men, a supportive leadership style also has a positive effect on co-workers support. This may be due to the fact that men are more likely to work in SET disciplines, where they are generally part of a research team and emphasis is on team work (Hakala, 2009; Visser et al., 2007).

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In line with previous research (Hausser et al., 2010; van der Doef & Maes, 1998; Vanroelen, Levecque, Moors, Gadeyne, & Louckx, 2009), our results also show that job control and co-worker support increase the well-being of both men and women. However, job demands showed a negative effect for male Ph.D. students only.

Unlike a directive leadership style, a supportive one has a positive direct but less strong effect on student's well-being. The effects of leadership style on well-being are both direct and indirect through the psychosocial work characteristics (job demands, control and co-worker support). These findings are in line with the results obtained by (Nielsen, Randall, et al., 2008), who focused on Danish healthcare workers and found that the effect of transformational leadership on employees' psychological well-being was to a large extent mediated by work characteristics such as increased role clarity, meaningfulness, and opportunities for development.

These results demonstrate a number of common paths between leadership style, psychosocial working conditions and work-related well-being for both male and female Ph.D. students. Although the structural models for men and women were not completely similar, no substantial differences exist in the mechanisms of how a directive and a supportive leadership style influences male and female Ph.D. students' psychosocial work characteristics and work-related well-being. Women did not differ from men with regard to job demands, job control, co-workers support and experienced leadership style, neither did they report more personal, work-organization or resources-related problems than men. One possible explanation for the absence of substantial gender differences might be that the population studied is on average quite young and the large majority of respondents have no children yet. For most doctoral students, balancing work and family life is not yet an important issue.

An interesting finding is that when the supervisor combines both types of leadership style, the positive effect of the supervisor's support on the well-being of female students disappears. This indicates that for female Ph.D. students, a directive leadership style not only has a direct negative effect on well-being, but also voids any potential benefits of a supportive leadership style. When a supervisor acts both supportive and directive, the high demands imposed by a directive supervisor in combination with the social support Ph.D. students receive from the same supervisor may lead to conflicting cognitions and mixed emotions about the supervisor, which in turn may negatively affect their well-being. However, the interaction between directive and supportive leadership styles has no effect on male students' well-being. Maybe the support male Ph.D. students receive from their colleagues might buffer the negative effect of a directive supervisor on well-being. This result is in line with the within-domain stress-buffering hypothesis stating that social support from the same source as the stressor strengthens the negative effects of this stressor, whereas social support from a different source

than the stressor (i.e. co-workers) buffers these negative effects (cross-domain stress buffering) (Lepore, 1992; Major et al., 1997). Support for these hypotheses was found in previous research investigating the consequences (i.e. somatic complaints, reduced self-esteem and psychological well-being) of social undermining and abusive supervision in a police and an educational setting, respectively (Duffy, Ganster, & Pagon, 2002; Hobman, Restubog, Bordia, & Tang, 2009).

The way in which a directive and a supportive leadership style, and the interaction between both, affect male and female Ph.D. student's well-being did not differ substantially across the three disciplines. Although, the exposure with regard to the supervisor's leadership style and psychosocial working conditions differed between the disciplines but not between men and women within the same discipline. This suggests that the academic culture within the various disciplines shapes students' perceptions but does not change the mechanism of how leadership style influences students' psychosocial working conditions and well-being.

When interpreting the results of the present study, some limitations need to be considered. For one, our study is based on a cross-sectional design, which does not allow causal statements. However, statistical techniques such as structural equation modeling may provide an indication of the causal direction of particular pathways in cross-sectional research. Another possible weakness is the use of self-reported measures for the exogenous and endogenous variables (i.e. leadership style, psychosocial working conditions and work-related well-being), which might have introduced a common method bias. Although, Spector, (2006) stated that these influences are not as high as could be expected. Another important issue relates to the generalizability of our findings to doctoral educational systems in other countries given that social roles and the supervisor-student relationship may be partially culturally determined. As both the Ph.D. student and the supervisor have a double status in the Flemish system, as a student and worker, and as an academic and administrative supervisor respectively, this also might have implications for the observed mechanisms and their exposure to leadership style, psychosocial working conditions and well-being.

Despite these limitations, our results stress the importance of the Ph.D. supervisor's leadership style and doctoral students' psychosocial working conditions for their work-related well-being. Promoting Ph.D. students' well-being is important given that a reduction in well-being has been found to be significantly related to a number of important work outcomes, including job performance and voluntary turnover (Griffeth et al., 2000; Wright & Huang, 2012). One way to improve doctoral student's well-being is by adapting the working conditions at the organizational-level. Our findings suggest that social support from colleagues and especially the job control Ph.D. students experience strongly influence their work-related well-being. Co-worker support has also been found to

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be a particularly important factor for the study progress of doctoral students (Martinsuo & Turkulainen, 2011).

Future research addressing the relationship between leadership style and Ph.D.'s well-being might benefit from taking into account demographic characteristics of both Ph.D. supervisors and students, for instance to investigate if the leadership styles of male and female supervisors might affect male and female student's well-being differently. Given that female full professors are still underrepresented at the Flemish universities (VLIR, 2012), the majority of doctoral students in our sample had a male Ph.D. supervisor.

Overall, the results of the current study suggest that, in contrast to a directive leadership style, a supportive leadership style has the most beneficial effect on the psychosocial working conditions and work-related well-being of both male and female Ph.D. students. Further research is needed to investigate whether the leadership style of the supervisor also has a direct effect on the progress and drop-out of Ph.D. students. By systematically questioning Ph.D. students who quit their Ph.D. project, information can be gathered concerning the reasons for dropping-out and the role of the supervisor in their decision to leave. The HR-services of universities could develop and implement such a systematic exit-questionnaire in line with the equal opportunities policy for men and women at their university.

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## Chapter 8. CONCLUSION AND DISCUSSION

### *8.1. Summary and main findings*

The general aim of this dissertation was to investigate the effects of job stress and work ability on employee well-being. The previous chapters dealt with several theoretical and empirical issues regarding the effects of work ability, job stressors and job resources in relation to employee well-being within three different samples of nurses and nursing aids, novice teachers and doctoral students.

Within the overarching theory of social stress, two leading work stress models, the Demand-Control-Support (DCS) model (Karasek, 1979; Karasek & Theorell, 1990; Johnson & Hall, 1988; Karasek et al., 1998) and the Effort-Reward Imbalance (ERI) (Siegrist, 1996) model, and work ability (Ilmarinen, Tuomi, & Klockars, 1997; Tuomi et al., 1991; Tuomi et al., 1997) served as a theoretical framework in this dissertation for studying the association between job characteristics and employee well-being. Three employee well-being components were distinguished: turnover intention, sickness absence and work-related well-being.

A first objective of this dissertation was to test the occupational stress models and work ability in relation to withdrawal behavior outcomes. This objective was addressed in three empirical studies as described in Chapters 3 to 5.

In the first empirical study, the effect of work ability on turnover intentions was assessed in a sample of 1531 nurses and nursing aids (see Chapter 3). Three types of turnover intentions were distinguished: within-organizational, intra-occupational and inter-occupational turnover intentions. Work ability can be conceived as the personal appraisal of an employee of his/her physical and mental work demands and one's ability to cope with these demands (Feldt, Hyvonen, Makikangas, Kinnunen, & Kokko, 2009). Our results showed that a poor work ability was associated with an elevated risk of developing high turnover intentions. This effect was strongest for within-organizational and intra-occupational turnover intentions. Neither the social support from colleagues, nor the social support of the supervisor could diminish the adverse effect of a poor work ability on nursing staff's turnover intentions but a borderline significant interaction effect was found between work ability and interpersonal relations at work on healthcare workers' intention to leave the current ward (i.e. within-organizational turnover intention). This interaction effect was, however, not observed for intra-occupational and inter-occupational turnover intentions. The change in work ability was also considered in this study, as work ability is a dynamic process that changes throughout the working life (Ilmarinen, 2001, 2009). A substantial decrease in work ability during a one year follow-up period was associat-

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ed with an elevated risk for developing various types of turnover intentions.

In the second study also based on the sample of 1531 nurses and nursing aids, the ERI model was tested in relation to intra-occupational and inter-occupational turnover intentions (see Chapter 4). Unlike previous studies, the full ERI model, including the extrinsic components (i.e. efforts and rewards) and the intrinsic component (i.e. overcommitment), was tested in a longitudinal design. Compared to employees who received sufficient rewards in turn for their efforts, nursing staff members who experienced a failed reciprocity between efforts and rewards had an increased risk of developing both intra- and inter-occupational turnover intentions during a one year follow-up period. Employees adopting an exhaustive work-related coping style (i.e. overcommitted employees), did not have a higher risk for developing turnover intentions. Similarly, overcommitted employees who also experienced an effort-reward imbalance, had no higher risk of developing intra- and inter-occupational turnover intentions. Thus, no support was found for the intrinsic and the interaction hypotheses (Siegrist et al., 2004). It appears that especially the situational work components of the ERI model play a role in developing intra- and inter-occupational turnover intentions.

In the third study based on a sample of 603 novice teachers, the ERI model was tested in relation to sickness absence (see Chapter 5). In this study, both the extrinsic and intrinsic components of the ERI model were included, although overcommitment was substituted by learning motivation. Opposed to overcommitment, learning motivation can be considered as a positive coping style. Learning motivation refers to the degree to which employees report themselves to be motivated to learn new behavior patterns and skills on their job, and to how keen they are to solve problems at their job and to adapt to the work environment (Taris, 2004). The obtained results showed that an imbalance between efforts and rewards was associated with longer sickness absence duration and more periods of absence. A low level of learning motivation was associated with absence frequency but not with absence duration. No support was found for an interaction effect between effort-reward imbalance and learning motivation on teachers' sickness absence duration and frequency. The situational components seem most important for predicting both absence duration and frequency.

In this dissertation we distinguished between co-worker support and supervisor support as possible resources in the social stress process. Supervisor support was integrated in a framework that explicitly considers the role of leadership style in the stress process of employees. The supervisor's leadership style plays an important role in defining the psychosocial work environment in which employees function (Barling, Kelloway, & Frone, 2005; Cummings et al., 2010) and has been found to influence employee well-being (Skakon, Nielsen, Borg, & Guzman, 2010). However, in the occupational stress models, the leadership style

of the direct supervisor is not considered as a potential stressor or resource. Therefore, a second objective of this dissertation was to investigate how the supervisor's leadership style influences employee well-being, by assessing both the direct effects on well-being and the possible mediating role by affecting the employee's psychosocial working conditions. This objective was addressed in the last two empirical studies that are presented in Chapters 6 and 7.

The aim of these last two studies was to assess how the work-related well-being of Ph.D. students is affected by the leadership style of their supervisor, taking into account the Ph.D. student's psychosocial working conditions, in terms of job demands, job control and co-worker support. Both studies were based on a sample of 1887 Ph.D. students. Two types of leadership style were considered: a relationship-oriented leadership style that is closely related to supervisor support (labeled as supportive leadership style), and a task-oriented leadership style, that is characterized by a strong focus on goal attainment by giving employees clear rules and instructions (labeled as an authoritative or directive leadership style). Because these directive (task-oriented) and supportive (relationship-oriented) leadership styles are relatively independent of one another, leaders may combine both styles to varying degrees (Yammarino, Dionne, Chun, & Dansereau, 2005).

In the fourth study, we found both a direct and indirect effect of the Ph.D. supervisor's leadership style on work-related well-being in a general sample of doctoral students (see Chapter 6). Doctoral students' well-being was lower when they perceived their supervisor as directive and higher when the supervisor adopted a supportive leadership style. The work-related well-being of Ph.D. students was also affected by the working conditions under which their doctoral project was being done. Job demands negatively affected work-related well-being, while job control and co-worker support had a positive effect. From these three working conditions, job control had the strongest effect on doctoral student well-being. Job demands increased and job control and co-worker support decreased when doctoral students perceived their supervisor as directive, while having a supportive Ph.D. supervisor positively affected job control and co-worker support. When the supervisor adopted both a supportive and a directive leadership style, the positive effect of a supportive Ph.D. supervisor on doctoral students' work-related well-being disappeared.

Despite the considerable attention that has been paid in literature to the leadership styles of male and female leaders (e.g. Eagly, Johannesen-Schmidt, & van Engen, 2003; Koenig, Eagly, Mitchell, & Ristikari, 2011), less is known about how leadership style affects the well-being of male and female employees. An additional objective of this dissertation was to assess if the effect of leadership style on students' work-related well-being differed for male and female Ph.D. students. This objective was addressed in the fifth empirical study (see Chapter 7). The results of

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this study were to a large extent similar to the results obtained in the fourth empirical study (see Chapter 6). A supportive leadership style had a positive effect on the well-being of both male and female students, whereas an authoritative leadership style had the opposite effect. Job control and co-worker support had a positive impact on both male and female Ph.D. students' well-being, while job demands negatively affected men's well-being. A supportive leadership style had a positive effect on job control for both men and women and on co-worker support for men only. Both male and female Ph.D. students reported lower job control and co-worker support and higher job demands when their supervisor adopted a directive leadership style. No substantial differences were found in how the leadership style of the Ph.D. supervisor influenced the well-being of male and female doctoral students. However, the negative effect of the interaction between a directive and supportive leadership style was only observed for female Ph.D. students. This indicates that female doctoral students who perceived their supervisor both as supportive and directive lose the benefits of having a supportive supervisor.

### 8.2. Discussion

In figure 8.1 we summarize the main findings of the dissertation. This figure builds on the conceptual model that was presented in Chapter 1.

In line with the proposed conceptual model our findings show that within a specific work setting, the leadership style of the immediate supervisor can act as a stressor in the social stress process through the filter of individual perception. Leadership style has a direct effect on employee well-being but also exerts an indirect effect by influencing other stressors and coping resources in the stress process. A task-oriented leadership style has a direct negative effect on employee well-being, whereas a relationship-oriented leadership style has the opposite effect. The indirect effect of leadership style is partially mediated by employees' psychosocial working conditions. When leaders adopt a task-oriented leadership style, this results in increased job demands and decreased coping resources in terms of lower co-worker support and job control. According to the DCS model, these conditions cause higher stress levels, triggering poor health and well-being (Karasek et al., 1998). A relationship-oriented leadership style has a positive effect on employees' coping resources, leading to higher level of job control and co-worker support. However, a lack of relationship-oriented behavior may act as a stressor in the social stress process as well.

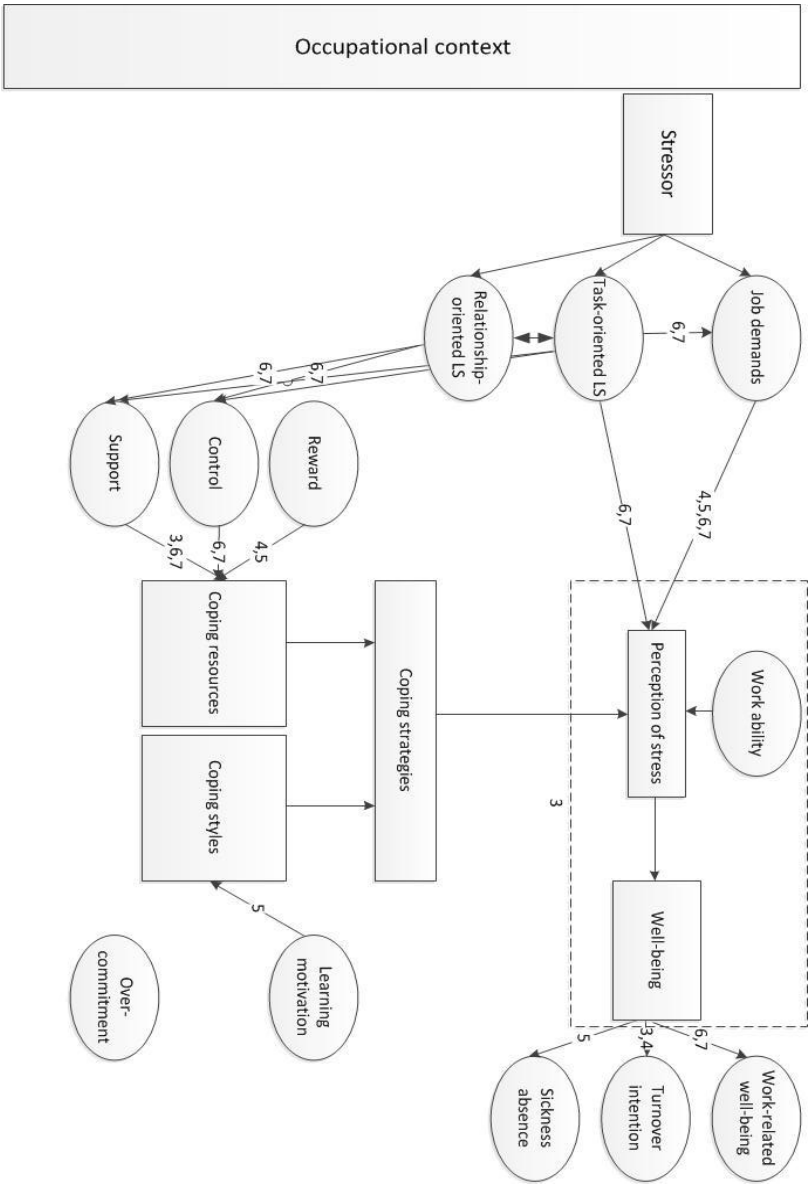


Figure 8.1. Main findings

The combination of both a task-oriented and relationship-oriented leadership behavior can also be conceived as a stressor, as the positive effects of a supportive leadership style on employees’ coping resources and well-being disappear when the leader is also directive. When a leader acts both supportive and directive, employees may experience conflicting

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cognitions and mixed emotions about the leader. According to the within-domain stress-buffering hypothesis, support from the same source as the stressor, in this case the directive leader, strengthens the negative effects of this stressor, whereas social support from a different source than the stressor (i.e. co-workers) buffers these negative effects (cross-domain stress-buffering) (Lepore, 1992; Major et al., 1997). In this dissertation, the interaction effect was only observed for women. Further research is needed to find out whether this effect can also be observed in other occupational groups or whether this is due to the specific occupational setting in which Ph.D. students operate. Different scientific cultures and according norms and practices, for instance with regard to funding resources and publishing strategies, may influence the relationship between the supervisor and his/her Ph.D. students. In our sample, male Ph.D. students were more likely to work in STEM (Science, Technology, Engineering and Mathematics) disciplines where they are generally part of a research team and emphasis on team work is more common (Visser, Luwel, & Moed, 2007; Hakala, 2009; Noy & Ray, 2012). Maybe the support male Ph.D. students receive from their colleagues in such research teams might buffer the negative effect of a directive leadership style on well-being, in line with the cross-domain buffering hypothesis. This might be to a lesser extent the case for Ph.D. students in other scientific disciplines, which are more oriented towards research on an individual basis (Hakala, 2009; Visser et al., 2007).

When employees are confronted with various types of stressors in their work environment, they are expected to play an active role in dealing with these stressors by constantly adapting their strategies and actions in an attempt to avoid or diminish distress, in line with the social stress paradigm (Pearlin et al., 1981; Pearlin, 1989). These applied coping strategies can be either problem-focused or emotion-focused and are shaped by the available coping resources and coping styles. Our results show that coping resources, involving co-worker support, job control and rewards, have a beneficial effect on employee well-being, through the filter of individual perception. Job control and social support mediate the negative effects of the stressors on individual well-being. However, situations where employees are not adequately and proportionately rewarded for their efforts (i.e. job demands), indicating an effort-reward imbalance, act as a stressor in the social stress process and can have harmful effects on employee well-being, in particular with regard to withdrawal behavior. The situational components of the ERI model (i.e. efforts and rewards), are important constituent components in the stress process to predict employees' turnover intentions and sickness absence. These findings are in line with previous studies (e.g. Godin & Kittel, 2004; Li et al., 2011; Hasselhorn, Tackenberg, and Peter, 2004; Kinnunen, Feldt, and Makikangas, 2008; Lavoie-Tremblay, O'Brien-Pallas, Gelinias, Desforges, & Marchionni, 2008). However, support for an effect of the intrinsic component of the ERI model on withdrawal behavior was less convincing. The intrinsic component was operationalized by

overcommitment and learning motivation and both were considered as individual coping styles within the stress process. Overcommitted employees, characterized by a strong ambition, in combination with the need to control and to gain esteem from others, did not have a higher risk of developing turnover intentions in our sample of Belgian nurses and nursing aids. Nevertheless, overcommitment was found to be associated with nurses' inter-occupational turnover intentions, both in a cross-sectional and longitudinal study among European nurses (Hasselhorn et al., 2004; Li et al., 2011). A possible explanation might be that within the specific occupational context of Belgian healthcare workers, overcommitment is a less adequate coping style to deal with the stressors at work. This may be illustrated by the fact that the overall level of overcommitment was lower for Belgian nurses than for nurses in other European countries, such as Slovakia and Italy (Li et al., 2011). Other coping styles may be more appropriate, like adopting a high level of learning motivation.

A low level of learning motivation had a negative effect on employee well-being and was found to be associated with more periods of absence but not with longer absences. This may be explained by the fact that both sickness absence measures result from different processes. Sickness absence duration is considered as 'involuntary absenteeism' resulting from a health impairment process (Bakker, Demerouti, de Boer, & Schaufeli, 2003). Conversely, absence frequency is considered as 'voluntary absenteeism' resulting from a motivational process, and can be interpreted as an escape from or compensation for aversive or demoralizing work circumstances (Chadwick-Jones, Nicholson, and Brown, 1982; Bakker et al., 2003). So, if employees are not intrinsically motivated to learn new skills and behaviors and to adjust to new situations they may report themselves ill as a way to compensate for dealing with the stressors in the work environment. Although the interaction between effort-reward imbalance and learning motivation did not have a significant effect on teachers' sickness absence, a tendency for an interaction effect was noticeable for sickness absence duration. Although we have to be cautious in interpreting this finding, this might suggest that a high level of learning motivation has a moderating effect on the adverse relation between effort-reward imbalance and sickness absence duration among teachers. However, further research is needed to confirm this finding in other occupational groups.

Adopting a high level of learning motivation might be an adequate coping style in a broad array of occupations, not only in the teaching profession. Learning motivation can also be of considerable importance in the work context of Ph.D. students as they are informally expected to be intrinsically motivated and not to restrict their performance to the regular working hours from nine to five. This "informal" expectation often results in high workload and frequent overtime work. However, when Ph.D. students gain more knowledge, skills, and experience, this will enable them to work more autonomously and to cope more effec-

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tively with their job demands. Within the limits of our data we were not able to assess the impact of this coping style for doctoral student well-being.

In addition to the workplace stressors and resources, the individual's perception of these stressors and coping resources are important components of the social stress process (Weis & Lonnquist 2006). Work ability can be conceived as an individual's appraisal of his/her job demands and his/her personal resources to cope with these demands. When employees evaluate their physical and mental job demands as stressful and their coping resources as inappropriate to deal with these stressors, their work ability is likely to decrease (Ilmarinen et al., 1997; Tuomi et al., 1997) and can in turn negatively affect employee well-being. Work ability may be of particular concern in the work context of nurses and nursing aids, as they are confronted in their work environment with a variety of stressors. Healthcare workers experience the same stressors as employees in other occupations (such as high workload, lack of autonomy, low occupational rewards), but also face different types of job demands, such as physical demands (e.g. lifting heavy patients) and emotional demands (Dollard, Dormann, Boydd, Winefield, Winefield, 2003; Dormann & Zapf, 2004). Our results showed that a poor work ability and a substantial deterioration in work ability resulted in higher risk for developing various forms of turnover intentions. Coping resources in terms of co-worker support and supervisor support could not buffer the adverse effect of a poor work ability on turnover intentions. However, a borderline significant interaction effect was found between work ability and interpersonal relations on nurses' intention to leave the current ward. As this effect was not observed for the more severe types of turnover intentions (i.e. intra- and inter-occupational), this suggests that good interpersonal relations are of particular importance in the immediate work context, but are less decisive factor for developing other types of turnover intentions. Previous studies have suggested that leadership quality and the local context (e.g. city size and job opportunities) are important factors that are strongly associated with nurses' intra-occupational turnover intentions, whereas personal factors and work-home conflict play an important role in developing inter-occupational turnover intentions (Flinkman, Laine, Leino-Kilpi, Hasselhorn, & Salanterä, 2008; Simon, Mueller, & Hasselhorn, 2010).

Summarized, our findings stress the importance of the psychosocial work environment for employee well-being. Within the overarching social stress process, the job stressors and coping resources, as defined by the DCS model and the ERI model, and work ability were found to influence employee well-being. To address the first research objective of this dissertation, the effort-reward imbalance model and work ability were tested in relation to withdrawal behavior outcomes. A failed reciprocity between efforts and rewards was associated with a higher risk of developing turnover intentions, and with more frequent absences and longer absence durations. Work ability and its change over time were



also associated with a higher risk of developing various types of turnover intentions.

To address our second research objective, the effect of two types of leadership style was assessed on the work-related well-being of Ph.D. students, by controlling for their psychosocial working conditions. Our findings indicated that leadership style is an important aspect of the work environment. Although a relationship-oriented leadership style and a task-oriented leadership style had opposite effects, they both influenced employee well-being directly and indirectly through job demands, job control and co-worker support. We also examined if the effect of leadership style on work-related well-being differed for men and women. No substantial differences were observed in the mechanisms of how both types of leadership style influenced the psychosocial working conditions and work-related well-being of male and female Ph.D. students.

### **8.3. *Limitations***

In this dissertation the DCS model and the ERI model were tested in relation to employee well-being in three specific occupational groups: nurses and nursing aids, novice teachers, and Ph.D. students. Although both models emphasize the interaction between employees and their work environment, they are basically individual level models. The work context is never explicitly featured in these models, and workplace conditions in the DCS and ERI model are almost exclusively defined at the micro level without considering meso (e.g. gender-balanced organization, work team climate) and macro level (e.g. structural problems on the labor market) factors that are essential from a social stress perspective. Although the work context in which the three occupational groups function was considerably different, in our studies these context factors also remain in the background. Although we acknowledge the different work contexts of the groups studied, the limitations of our data prohibited a comparative analysis of contextual effects on the occupational stress models.

It should be acknowledged that within the limits of the available data, not all subcomponents of the conceptual model could be addressed in one single study. The two occupational stress models, work ability and the supervisor's leadership style were tested in three different occupational contexts. This may limit the generalizability of our findings to other occupational settings. Comprehensive studies are needed that allow testing the full conceptual model and enable cross-validation.

An important stressor in the occupational context that was not represented in the proposed conceptual model was emotional demand. Emotional demand can be considered as customer-related social stressors that result from the interaction with clients, and the behavior of customers during such interactions (Dollard et al., 2003; Dormann & Zapf, 2004). Examples of emotionally demanding tasks include dealing with the aggressive behavior, suffering, or traumatic experiences of clients.

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For human service employees, in particular for nurses and nursing aids, stressors related to interactions with clients may constitute equally important or even more important job demands than the psychological demands, in terms of workload and time pressure (van Vegchel, 2005).

Another important feature of the social stress process is that stressors in one role domain (e.g. at work) may have impact in other life domains (e.g. family life) (Pearlin 1981, 1989). This carryover effect can be observed, for example, when job conditions lead to an increasing work-family conflict (Wallace, 2005). Work-family conflict is commonly defined as a situation in which the role pressures from the work and family domains are mutually incompatible in some respect (Greenhaus & Beutell, 1985). This conflict between work and family is bidirectional in nature: work may interfere with the private life (work-home interference) and life at home may interfere with work (home-work interference). In our study, we did not consider work-family conflict as an aspect of the social stress process that can affect employee well-being, especially in terms of withdrawal behavior. However, work family conflict was found to be strongly associated with inter-occupational turnover intentions among nurses (Flinkman et al., 2010; Simon et al., 2010). Work-family conflict, in particular home-work interference, was also related to both sickness absence frequency and duration (Clays, Kittel, Godin, De Bacquer, De Bakcer, 2009).

### ***8.4. Directions for future research***

The work context entails stressors at many different levels of reality: micro (e.g. heavy workload), meso (e.g. work team conflict) and macro (e.g. job insecurity due to economic recession). However, occupational stress research has mainly focused on micro level factors, and has only implicitly assumed that psychosocial working conditions are multidimensional phenomena determined by processes at different organizational levels (Härenstam, 2008). For future research, we recommend to adopt a multilevel approach that also considers the contextual effects of the work environment.

At the micro level, our proposed conceptual model could be extended by considering emotional demand as a potential stressor in the stress process, and by taking into account employees' work-family conflict, as an additional psychosocial factor that can impact upon employee well-being.

At the meso-level work context factors need to be considered, either at the organizational level or on team-level, when it relates to smaller organizational units. For example, affective team climate can be incorporated within the social stress framework. Affective climate refers to the interpersonal and social relations among workers, more specifically to participation, cooperation (mutual support), warmth (friendliness, good fellowship) and social rewards (praise) (Ostroff, 1993). A positive affective team climate may form a resource in the social stress process, as

previous research has shown that when the affective team climate is positive, everyone within the team benefits, even those team members who hold a negative perception of their emotional work environment (Levecque, Roose, Vanroelen, & Van Rossem, in press). Conversely, a negative team climate may form a stressor on its own, damaging the well-being of workers, even if they themselves evaluate the team climate as more positive (Levecque et al., in press). Leaders can contribute to the creation of a positive work climate. Parris and Peachey (2013) suggested, based on a systematic review of literature, that leadership influences employees' well-being by creating a positive work climate.

When investigating the relationship between leadership and employee well-being, future studies could take into account both the individual's perception of the leadership of his/ her supervisor and group-level leadership. Group-level leadership is based on the idea that the leader acts equally toward all followers (Dansereau, Alutto, & Yammarino, 1984) and as a result followers develop a similar perception of their leader's behaviors. Including both individual and group -level perceptions of leadership, may contribute to our understanding of how leadership affects employee well-being. Nielsen and Daniels (2012) argued that leaders should be aware that followers' well-being is not only shaped by their direct interactions with their leader but that the group context also plays a role in shaping their shared perceptions of their working conditions.

The models used in this study are basically individual level models of how stress affects workers' well-being. They do acknowledge that these processes depend on the context of the work and employment environments, but do not explicitly incorporate environmental factors, such as employment conditions and job insecurity. In this study stress processes in three distinct occupational contexts are studied, but the design of this study did not allow for a systematic comparison of such context. A direction for future research would be to study in a systematic manner how factors related to the employment and working context affect the various components of the occupational stress models. Such project would require the sampling of a broader range of work and employment contexts.

Well-being is a multi-dimensional construct with facets in work and non-work domains. In line with the recommendations of Pearlin (1989) further research should not focus on a single well-being indicator but instead include a range of well-being constructs covering mental and physical health-related outcome (i.e. vitality, burnout and sleep quality) and work-related outcomes (e.g. job satisfaction, turnover intentions). If only a single outcome indicator is considered, those who respond to a stressful experience by manifesting some other forms of distress are mistakenly treated as though they are unaffected by the stressor.

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## Conclusion and discussion

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## SAMENVATTING

De term ‘werkstress’ wordt vaak gebruikt als verzamelnaam voor de (nadelige) effecten op de gezondheid en het welzijn van werknemers als gevolg van een mis-match tussen de vereisten van de werkomgeving en de individuele kenmerken van werknemers, zoals hun capaciteiten, vaardigheden en noden. De prevalentie van werkstress is hoog en gaat gepaard met allerlei gezondheidsklachten, een hoog ziekteverzuim en een hoge arbeidsongeschiktheid. Werkstress is een belangrijk aandachtspunt voor organisaties, maar ook voor de samenleving in zijn geheel, gezien werkstress niet alleen een invloed heeft op de gezondheid en het welzijn van individuele werknemers maar ook een hoge socio-economische kost voor alle stakeholders met zich meebrengt.

Werkstress kan theoretisch gekaderd worden binnen de ‘social stress’ theorie (Pearlin et al., 1981). Volgens dit ‘social stress’ paradigma maken werknemers deel uit van een ruimere context die grotendeels de stressoren (stress-veroorzakende factoren) bepaalt waaraan ze worden blootgesteld (Pearlin et al., 1981, Pearlin 1989). Binnen een bepaalde werkcontext kunnen verscheidene types van stressoren voorkomen op verschillende niveaus: op het microniveau (bv. tijdsdruk, hoge werkbelasting), het mesoniveau (bv. conflicten binnen het team) en het macroniveau (bv. jobonzekerheid door economische recessie). Wanneer werknemers geconfronteerd worden met dergelijke stressoren in hun werkomgeving maken ze een evaluatie van de mogelijke impact die deze stressoren kunnen hebben op hun welzijn. Wanneer een stressor als stresserend wordt ervaren, kunnen werknemers een beroep doen op hun persoonlijke en werk-gerelateerde ‘resources’ (hulpbronnen) zoals de sociale steun van collega’s en leidinggevende om het hoofd te bieden aan deze stressoren. Indien de stressoren niet op een succesvolle manier worden aangepakt kan dit een weerslag hebben op hun gezondheid en welzijn.

Om de relatie tussen werk en de gezondheid en welzijn van werknemers te onderzoeken werden in het verleden verschillende jobstress modellen ontwikkeld. Twee prominente modellen zijn het Demand-Control-Support (DCS) model (Karasek, 1979; Karasek & Theorell, 1990) en het Effort-Reward Imbalance (ERI) model (Siegrist, 1996). Beide modellen voorspellen dat werknemers een hoger risico lopen om een negatief effect op hun welzijn te ondervinden wanneer ze geconfronteerd worden met hoge taakeisen maar onvoldoende resources of hulpbronnen ter beschikking hebben om met die taakeisen om te gaan. Het DCS model veronderstelt dat taakeisen (demands), de controle in of over het werk (job control) en de steun van collega’s en de leidinggevende (support) de belangrijkste werkkenmerken zijn die het welzijn van werknemers beïnvloeden. Het ERI Model benadrukt de wisselwerking tussen inspanningen (efforts) die werknemers leveren en de beloningen (re-

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wards) die daar tegenover staan. Beloningen omvatten zowel het loon maar ook carrièremogelijkheden, jobzekerheid en waardering. Het ERI model bestaat niet alleen uit situationele componenten maar bevat ook een intrinsieke component: 'overcommitment'. Werknemers met een hoge mate van overcommitment zijn zeer gericht op prestaties en complimenten en hebben moeite om hun werk los te laten. Een (te) hoge betrokkenheid bij het werk kan eveneens een ongunstig effect hebben op de gezondheid en welzijn van werknemers.

Een ander belangrijk concept is dat van 'work ability'. Work ability kan gedefinieerd worden als de perceptie van werknemers over hoe ze functioneren in hun huidige job rekening houdend met de fysieke en mentale werkvereisten en hun persoonlijke resources. Met persoonlijke resources worden zowel de gezondheid, de fysieke, mentale en sociale capaciteiten als de motivatie, attitudes en competenties van werknemers bedoeld. Wanneer de persoonlijke resources niet opwegen tegen de werkvereisten, leidt dit op termijn tot een verminderde work ability (Ilmarinen et al., 1997; Ilmarinen, 2009). Eerder onderzoek heeft aangetoond dat een verminderde work ability geassocieerd is met langdurig ziekteverzuim, vervroegd pensioen en arbeidsongeschiktheid.

Het theoretisch kader dat gebruikt wordt in dit proefschrift vertrekt vanuit het overkoepelende 'social stress' paradigma. Dit stressmodel wordt verder geconcretiseerd door in te zoomen op de werkcontext waarbij de inzichten van het DCS model en het ERI model als leidraad dienen om de relatie tussen taakeisen (cf. demands, efforts), job resources (bv. beloning, autonomie, sociale steun) en welzijn te operationaliseren. Work ability wordt beschouwd als een component binnen het 'social stress' proces die de relatie tussen stressoren en welzijn medieert. Welzijn kan ruim geïnterpreteerd worden en omvat zowel fysieke (bv. cardiovasculaire aandoening) psychologische (bv. jobsatisfactie) als gedragscomponenten (bv. alcoholmisbruik). Dit proefschrift focust op werkgerelateerd welzijn en 'withdrawal behavior' (zie verder).

In de afgelopen decennia is heel wat wetenschappelijke evidentie opgebouwd over psychosociale stressoren in de werkomgeving en hun invloed op de gezondheid en het welzijn van werknemers. Toch blijken er nog verschillende tekortkomingen te zijn in de bestaande literatuur. Deze tekortkomingen vormen de basis voor de onderzoeksdoelstellingen in dit doctoraat.

Eerst en vooral blijken bovenvermelde stressmodellen in de empirische literatuur hoofdzakelijk getest te zijn in relatie tot een brede waaier aan fysieke en mentale klachten en ziektes maar in veel mindere mate in relatie tot gedragsuitkomsten zoals 'withdrawal behavior'. Withdrawal behavior is het gedrag dat werknemers stellen door voor een korte of langere termijn afwezig te zijn op het werk als men daar verwacht wordt. Voorbeelden van withdrawal behavior zijn: te laat komen op het werk, ziekteverzuim en vrijwillig vertrek (verloop). Ook zijn er maar weinig studies die de relatie tussen work ability en withdrawal behavior hebben

onderzocht. Een eerste doelstelling van dit doctoraat bestond er in om de beschreven jobstress-modellen en work ability te testen in relatie tot verschillende types van withdrawal behavior, namelijk verloopintentie en ziekteverzuim.

Ten tweede speelt de leiderschapsstijl van de leidinggevende een belangrijk rol in het bepalen van de psychosociale werkomgeving waarin werknemers functioneren. Afhankelijk van de leiderschapsstijl van de directe leidinggevende, kan dit een positief of negatief effect hebben op het welzijn van werknemers. Ondanks het feit dat binnen de beschreven jobstress-modellen stressoren en resources in de werkomgeving centraal staan, wordt leiderschapsstijl in geen enkel model expliciet opgenomen als een mogelijke stress-veroorzakende factor en/of resource. Een tweede doelstelling van dit doctoraat was om na te gaan welke invloed de leiderschapsstijl van de directe leidinggevende heeft op het welzijn van werknemers door rekening te houden met de mogelijk medeëerde rol van bepaalde werkkenmerken.

Daarnaast blijkt uit eerder onderzoek dat mannen en vrouwen een andere voorkeur hebben voor bepaalde leiderschapsstijlen. Bijgevolg kan een bepaalde leiderschapsstijl mogelijk een andere invloed hebben op het welzijn van mannelijke en vrouwelijke werknemers. Een bijkomende onderzoeksdoelstelling bestond er in om na te gaan of dit inderdaad zo is.

Deze doelstellingen werden verder uitgewerkt in vijf empirische hoofdstukken. De eerste doelstelling werd behandeld in de eerste drie empirische artikels (zie hoofdstuk 3, 4 en 5).

In hoofdstuk 3 werd in een steekproef van 1531 verpleegkundigen en verpleegassistenten onderzocht wat de invloed is van een verminderde work ability op de intentie om vrijwillig te vertrekken (verloopintentie). Drie vormen van verloopintentie werden onderscheiden: de intentie om van afdeling te veranderen, de intentie om de organisatie te verlaten en de intentie om te stoppen met het verpleegkundig beroep. De resultaten tonen aan dat een verminderde work ability de kans verhoogt om één jaar later een hoge intentie te hebben om weg te gaan. Dit is zeker het geval voor de intentie om de afdeling te verlaten en de intentie om de organisatie te verlaten. Een substantiële vermindering in work ability over een periode van een jaar leidt eveneens tot een hoger risico op het ontwikkelen van hoge verloopintenties.

In hoofdstuk 4, dat ook gebaseerd is op de steekproef van 1531 verpleegkundigen en verpleegassistenten, werd het ERI model getest in relatie tot verloopintentie. Het verplegend personeel had een verhoogd risico op zowel een hoge intentie om de organisatie te verlaten als op een hoge intentie om te stoppen met het verpleegkundig beroep wanneer er een onevenwicht bestond tussen de inspanningen die geleverd werden en de beloningen die er tegenover stonden. Een hoge mate van overcommitment bleek niet geassocieerd te zijn met een verhoogd risico op het ontwikkelen van verloopintenties.

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In hoofdstuk 5 werd in een steekproef van 603 beginnende leerkrachten het ERI model getest in relatie tot ziekteverzuim, daarbij werd een onderscheid gemaakt tussen ziekteduur en ziektefrequentie. Een discrepantie tussen de geleverde inspanningen en de verworven beloningen was geassocieerd met een langere ziekteduur en een hogere ziektefrequentie. In deze studie werd de overcommitment component vervangen door leermotivatie. Wanneer leerkrachten een lage leermotivatie hadden, bleken ze een hoger risico te lopen om vaker afwezig te zijn in vergelijking met collega's die wel over een hoge leermotivatie beschikten.

De andere onderzoeksdoelstellingen werden in hoofdstuk 6 en 7 behandeld. Deze empirische hoofdstukken zijn gebaseerd op een steekproef van 1887 doctoraatsstudenten. In beide hoofdstukken werd onderzocht wat het effect is van de leiderschapsstijl van de promotor op het werk-gerelateerde welzijn van hun doctoraatsstudenten. Er werd hierbij ook rekening gehouden met de mogelijk medeëerde rol van werkenmerken zoals taakeisen, jobcontrole en steun van collega's. Twee types van leiderschapsstijl werden in overweging genomen: een directieve of sturende leiderschapsstijl en een ondersteunende leiderschapsstijl.

In hoofdstuk 6 werd zowel een direct als indirect effect van leiderschapsstijl op het werk-gerelateerde welzijn van doctoraatsstudenten gevonden. Dit betekent dat de associatie tussen leiderschapsstijl van de promotor en het welzijn van doctoraatsstudenten deels gemedieerd wordt door de taakeisen, jobcontrole en sociale steun van collega's die doctoraatsstudenten ervaren. Taakeisen zijn negatief geassocieerd met het werk-gerelateerde welzijn van doctoraatsstudenten, terwijl een positieve associatie gevonden werd tussen een hoge jobautonomie en veel steun van collega's enerzijds en welzijn anderzijds. Wanneer de promotor een sturende leiderschapsstijl heeft, heeft dit een negatieve invloed op het welzijn van doctoraatsstudenten. Het hebben van een ondersteunende promotor daarentegen is positief geassocieerd met hun werk-gerelateerd welzijn. Wanneer een promotor zowel ondersteunend als sturend optreedt, wordt het positieve effect van een ondersteunende leiderschapsstijl teniet gedaan door het negatieve effect van een sturende leiderschapsstijl.

In hoofdstuk 7 werd onderzocht of een sturende en een ondersteunende leiderschapsstijl het werk-gerelateerde welzijn van mannelijke en vrouwelijke doctoraatsstudenten op een andere manier beïnvloedt. Opnieuw bleken de taakeisen, de jobcontrole en de steun van de collega's een medeërende rol te spelen in de associatie tussen leiderschapsstijl en welzijn. Een sturende leiderschapsstijl is voor zowel mannelijke en vrouwelijke doctoraatsstudenten negatief geassocieerd met hun welzijn, terwijl een ondersteunende leiderschapsstijl hiermee positief geassocieerd is. Er werden geen noemenswaardige verschillen gevonden in het effect van leiderschapsstijl op het welzijn van mannelijke en vrouwelijke doctoraatsstudenten noch in de onderliggende mechanismen die hierin een rol

spelen. Enkel bij vrouwen verdwijnt het positieve effect van een ondersteunende leiderschapsstijl wanneer hun promotor zowel sturend als ondersteunend is.

Samengevat kunnen we stellen dat jobstress-modellen zoals het ERI model ook aangewend kunnen worden voor de studie naar withdrawal behavior bij werknemers. Wanneer werknemers onvoldoende beloond worden voor hun inspanningen verhoogt dit de kans dat ze dergelijk gedrag zullen stellen of toch minstens de intentie daartoe zullen ontwikkelen. Beloningen vormen een belangrijke resource voor werknemers om, om te gaan met de taakeisen op het werk. Niet alleen het loon is van belang maar ook de carrièremogelijkheden en de waardering die men krijgt voor zijn/haar werk spelen een belangrijke rol.

Het concept work ability kan eveneens gebruikt worden om withdrawal behavior te voorspellen. Wanneer werknemers het gevoel hebben dat ze de fysieke en mentale werkvereisten moeilijk aankunnen doordat hun gezondheid en fysieke en mentale capaciteiten dit niet toelaten, kan dit op termijn withdrawal behavior in de hand werken.

Ten slotte blijkt dat de leiderschapsstijl van de directe leidinggevende niet alleen een rechtstreeks effect heeft op het welzijn van zijn/haar werknemers maar ook een indirecte invloed heeft door andere stressoren (taakeisen) en resources (jobautonomie en de steun van collega's) in het sociale stress proces te beïnvloeden. De manier waarop leiderschapsstijl het welzijn van mannelijke en vrouwelijke werknemers beïnvloedt, blijkt niet substantieel verschillend te zijn.

De bevindingen uit de empirische hoofdstukken tonen aan dat voor de drie verschillende beroepsgroepen de psychosociale werkomgeving een belangrijke invloed heeft op het welzijn van werknemers. In de werkcontext worden werknemers blootgesteld aan diverse stressoren maar indien ze voldoende persoonlijke en werk-gerelateerde resources hebben zoals voldoende beloning voor hun werk, sociale steun en jobautonomie hoeft dit niet noodzakelijk een negatieve invloed te hebben op hun welzijn. Een belangrijke richting voor verder onderzoek naar het welzijn van werknemers, en meer bepaald naar withdrawal behavior, is om naast stressoren en resources die voorkomen op het microniveau (bv. hoge taakeisen, jobautonomie) ook contextfactoren op het mesoniveau (bv. positief team klimaat, gendersamenstelling binnen de organisatie) en het macroniveau (bv. jobonzekerheid als gevolg van een economische recessie) mee in overweging te nemen door middel van een 'multilevel' benadering.